ELECTRICAL TIMES

THURSDAY
18 SEPT.
1952
NINEPENCE

HERE'S A COPY FOR YOU.....

WINGS DAY
SEPT 20th
Give for those who Gave

This Publication (No. 314) describes the wide variety of types of BICC Insulated Cut-Outs which can be supplied.

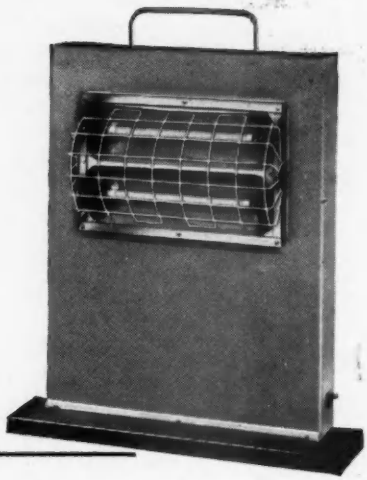
They are shock-proof and fire resistant and therefore particularly suitable for domestic installations.

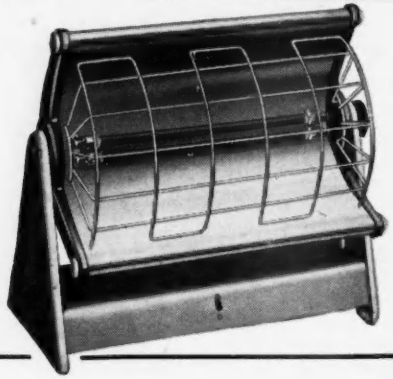
Write for your *copy today !*

BRITISH INSULATED CALLENDER'S CABLES LIMITED
NORFOLK HOUSE, NORFOLK STREET, LONDON, W.C.2

ORDER YOUR B·N·E FIRES

Now





Model F.43 (above). Satin silver finish with black and chromium fittings. 2 kW, one bar controlled by switch.

£9.11.0 (Inclusive of P.T.)

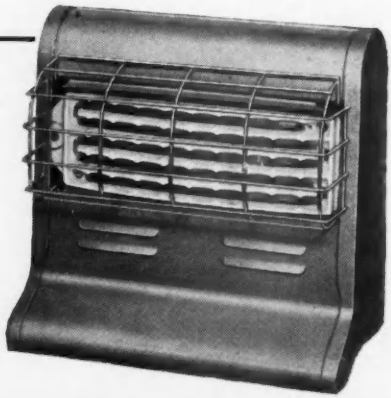
Model F.103 (left). A high quality reflector fire in black and ivory. 2 kW, one bar controlled by switch.

£9.19.6 (Inclusive of P.T.)

Model F.101 (1 kW) and **F.102** (2 kW). Two good quality fires at very reasonable prices. Finished in florentine bronze.

F.101 **£3. 9.6** (Inclusive of P.T.)
F.102 **£4.19.9** (Inclusive of P.T.)

All B.N.E. Fires are fitted with guards that comply with B.S. 1670/51. Full details are given in the B.N.E. Heating Appliances catalogue — have you had your copy?



A BNE Product

BRITISH NATIONAL ELECTRICS LTD.

THE DOMESTIC APPLIANCES SECTION OF JOHNSON & PHILLIPS LTD.

NEWARTHILL MOTHERWELL SCOTLAND

STEPLESS VARIABLE SPEED ON A.C. IS

Simple

(No valves or other complications)

Reliable

(Thousands of installations in service)

Available from stock

with an

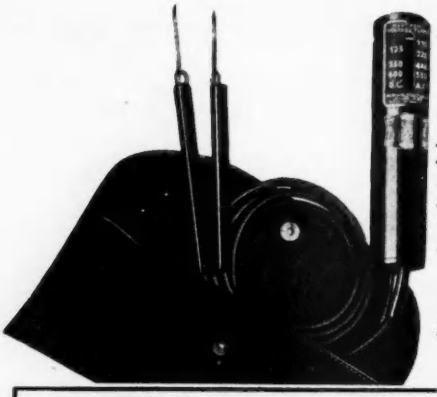
N-S VARIABLE SPEED A.C. MOTOR

Stepless variable speed, essential for maximum quantity and quality of production in many processes, can be obtained with simplicity, efficiency and reliability with the N-S variable speed a.c. motor, which is controlled by an induction regulator and can be arranged for direct, remote or automatic control. Motors can be made for almost any speed range or output required, ventilated or totally enclosed, and small sizes are available from stock or in a few weeks.

LAURENCE, SCOTT & ELECTROMOTORS LTD

NORWICH MANCHESTER LONDON & BRANCHES

A



is it alive?
240 or 440V.?
A.C. or D.C.?
which is "earth"?

The MARTINDALE VOLTAGE TESTER

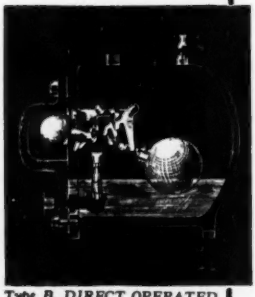
tells you instantly

OVER 200,000 IN USE

Light yet sturdily built for constant duty and long life. Easily carried in the pocket. **NO** glass to break. **NO** gas to leak.

MARTINDALE ELECTRIC CO.
45 WESTMORLAND ROAD, LONDON,
Phone: Colindale 8642-3 Grams: "Commstones, Hyde,

Trap your heat in BRADFORD STEAM TRAPS



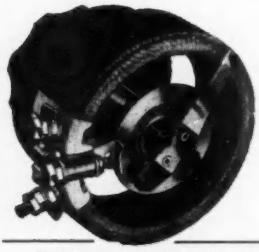
Type B. DIRECT OPERATED DISCHARGE VALVE

Fuel is too expensive to waste. Every thermal unit must be converted into energy. Bradford Steam Traps ensure efficient use of steam and heat. Instantaneous opening and closing action prevents damage to valves and seats. There is a "Bradford" trap to suit all steam pressures. Every trap fully tested and guaranteed.

United States Metallic Packing
COMPANY LIMITED

SOHO WORKS, BRADFORD, YORKSHIRE. Telephones: 41284-41285
Branch Offices: LONDON, Liverpool, Bolton, Newcastle, Cardiff Southampton.

TOROIDAL WOUND POTENTIOMETERS

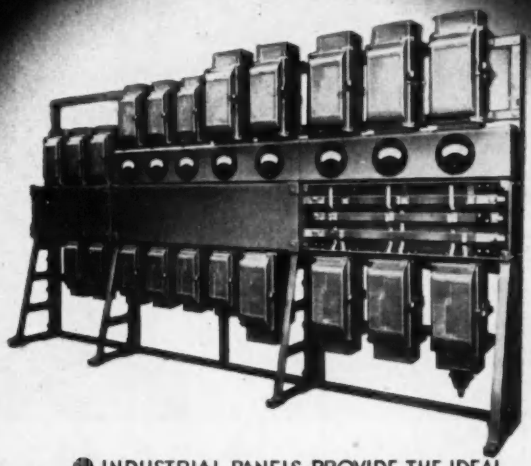


Efficient and Reliable, these instruments are second to none. Our Technical service will be happy to advise you in any difficulty, so do not hesitate to get in touch with us soon.

CRESSALL

Registered Trade Name of

THE CRESSALL MANUFACTURING CO. LTD
Tower Street, Birmingham 19
Telephone: ASTon Cross 2666 (3 lines)
Telegrams: "OHMIC Birmingham"



INDUSTRIAL PANELS PROVIDE THE IDEAL MAIN DISTRIBUTION FOR THEATRES, FACTORIES, HOSPITALS, HOTELS AND ALL PUBLIC BUILDINGS

INDUSTRIAL PANELS ENSURE THAT ALL SECTIONS OF AN INSTALLATION ARE UNDER ONE MAIN CONTROL

A SPECIAL TECHNICAL STAFF WILL ASSIST WHERE NECESSARY AND TENDERS WILLINGLY SUPPLIED TO YOUR OWN SPECIFICATION

BILL SWITCHGEAR LTD
ASTON LANE, PERRY BARR
BIRMINGHAM · 20

MIDLANDS.	LONDON. S.W.1.	NORTH MIDLANDS.	SOUTH WALES.	MANCHESTER.3.	BRISTOL.3.	YORKSHIRE.
G.H.GARBETT.	A.W ZELLEY.	C.G. BACHELOR.	C. GEARING.	H.H.POLLARD.	W.L.WHITE.	N.SHARPLES.
HEAD OFFICE.	6a PETER ST.	HEAD OFFICE.	HEAD OFFICE.	WOOD STREET.	CHURCH LANE.	HEAD OFFICE.

NO, IT'S THE "Belling" COOKER WITH THE INNER GLASS DOOR

People are seeing the Belling national advertising campaign, seeing it often, talking about it, and going to see the Belling cooker in showrooms and shops. And no wonder. It's the kind of advertising that creates demand. A big demand. The result of this advertising will be bigger and better sales for us and for you so don't let your stock fall too low.

HERE ARE THE FACTS ABOUT THE BELLING 47AB. Full size Inner Glass Door. Extra large oven with Automatic heat control. Two boiling plates and grill-boiler. Large hot-cupboard for keeping plates and food hot. Finished in sparkling cream or white acid-resisting vitreous enamel. Extra-durable black hob. £34.12.6.

BELLING & CO. LTD. • BRIDGE WORKS, ENFIELD, MIDDX. • HOWard 1212
CRC 391

By courtesy of E. F. Pressey, Esq., F.R.I.C.S., Engineer and Surveyor, Borough of Wokingham.

Eleco Planned Lighting

makes roads safer at night

One picture can convey as much as a hundred words. Look therefore at this reproduction from an un-retouched photograph of the ELECO installation on the Reading-Ascot Road (A.329) at Wokingham, Berkshire. *Observe, too, how planned lighting enhances the beauty of the countryside at night.*

Technical Data

Road width 30 ft. Illumination by ELECO "Golden Ray" 140 watt lanterns, at 150 ft. intervals and 25 ft. above roadway, on Concrete Columns.

Engineering and Lighting Equipment Co. Ltd.

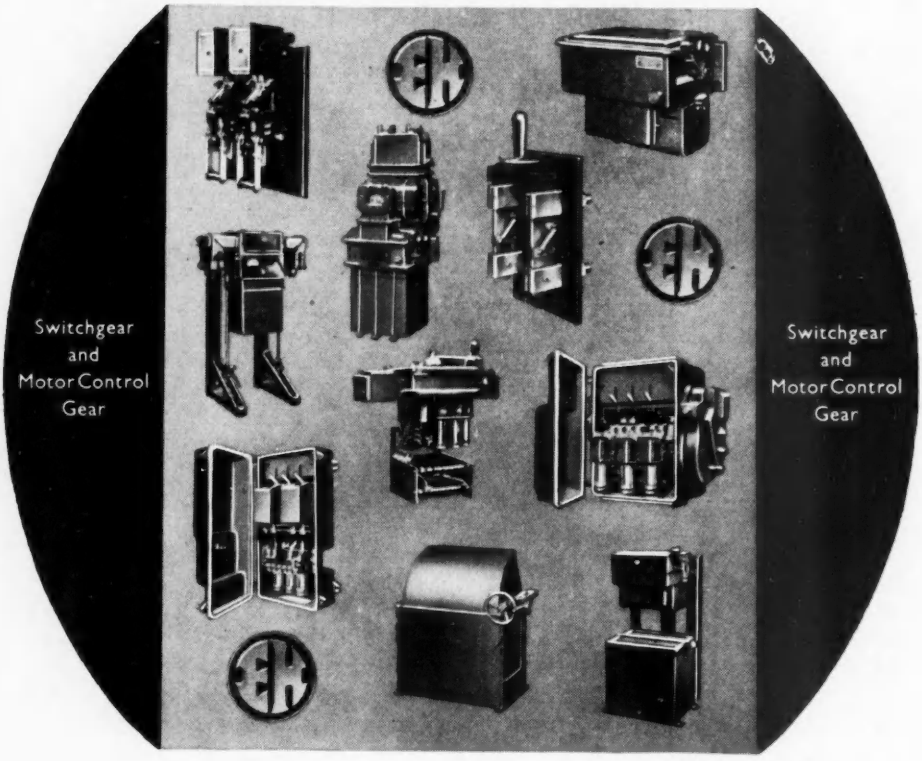
SPHERE WORKS, ST. ALBANS, HERTS

Telegrams: VOLTARCON, ST. ALBANS Telephone: ST. ALBANS 2258/2259

ELECO

Standardise on "Erskine Heap"

SPECIALISTS IN THE MANUFACTURE OF SWITCHGEAR SINCE 1905



It's the Switchgear engineers like to *"Live"* with

SWITCHGEAR. 50 Amps. up to 5,000 Amps.
MOTOR CONTROL GEAR. ¼ H.P. up to 5,000 H.P.

May we have your enquiries?

ERSKINE, HEAP & Co LTD

SWITCHGEAR SPECIALISTS

Head Office and Works
BROUGHTON, MANCHESTER (7)

London Office
GRAND BUILDINGS, TRAFALGAR SQ., W.C.2

BRANCH OFFICES AND AGENCIES IN ALL PARTS OF THE WORLD

for the *new* House of Commons

The provision of emergency lighting equipment in the new House of Commons was entrusted to Chloride Batteries Limited. A 240-volt battery of 122 DBG6 Chloride Planté sealed-in type cells (*capacity* 180 *ampere-hours at the* 10 *hour rate of discharge and capable of maintaining a load of* 10 *kW for* 3 *hours*) has been installed with a special maintained type Keepalite Automatic Emergency Lighting equipment. The battery is kept in a fully charged condition by trickle-charging and is instantaneously brought into use by the Keepalite equipment on an interruption of the mains supply. Another Chloride Planté battery of 25 ASG2 sealed-in type cells (capacity 20 ampere-hours) has been provided to operate the electric clock system in the House.

These batteries were installed with the approval of the Ministry of Works.

A PRODUCT OF CHLORIDE BATTERIES LIMITED

Exide Works, Clifton Junction, Nr. Manchester, and 137 Victoria Street, London, S.W.1.

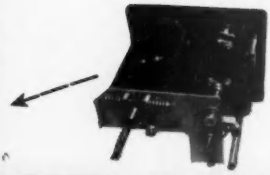
MAKERS OF EXIDE BATTERIES

S.62

OLYMPIA
Sept. 17 - Oct. 4

Many famous Machine Tools rely upon . . Igranic Control Gear

This "CORONA" 6-Spindle Drilling Machine, Manufactured by Fredk. Pollard and Co., Ltd. Employs a Specially Designed Igranic Built-in Pole Change Speed Controller Providing Effortless Electrical Speed Change and Instantaneous Braking.



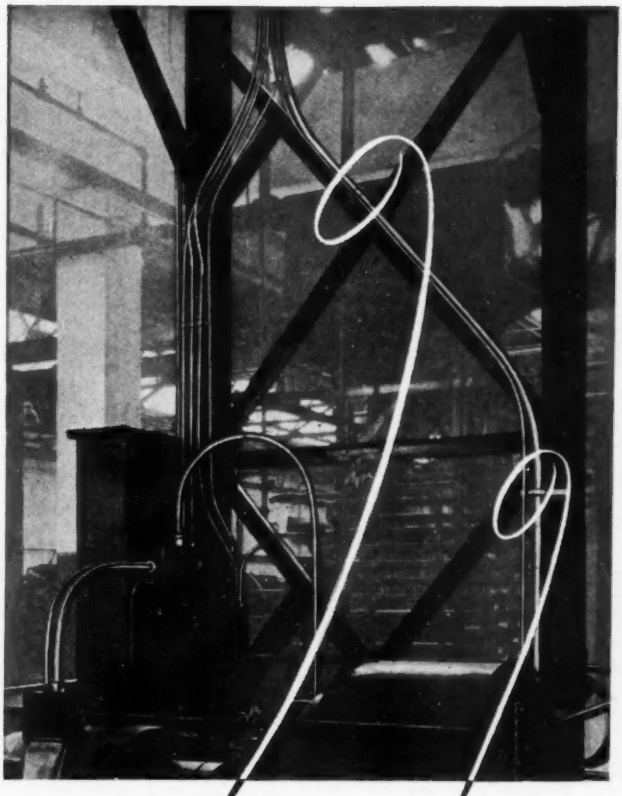
WE WILL BE GLAD TO SEE YOU
on
STAND No. 266
Second Floor
EMPIRE HALL

Machine Tool Control

. . . SPECIALLY DESIGNED AND BUILT FOR THE JOB

MOTOR IGRANIC CONTROL

IGRANIC ELECTRIC CO. LTD.
HEAD OFFICE and WORKS: BEDFORD



One! Two!

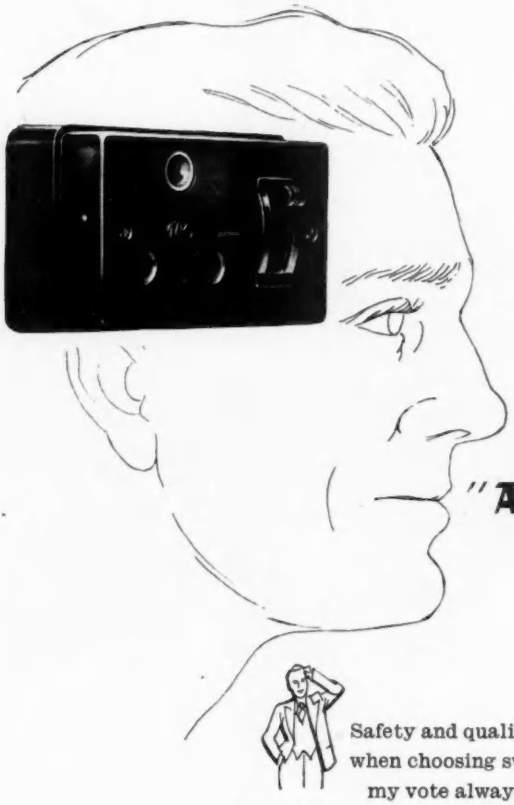
. . . it's surprising how few

. . . supports are required for J. & P. Aluminium Sheathed Cables. The lightness and strength of the aluminium sheath greatly facilitates erection and reduces cost considerably.

British Patent Nos. 627815 & 627793

JOHNSON & PHILLIPS LTD.
CHARLTON LONDON S.E.7
The mark that means that "little more" in quality

MK 60



"Always in mind

Safety and quality are the points I never forget when choosing switchsockets. That is why my vote always goes to MK. Here are the combined virtues of MK switches and MK socket-outlets —long life, easy installation and silent switching; while the unique MK spring-grip shuttered socket-contacts ensure that decisive snap action which sends the plug right home. You would expect to have to pay a bit more for such outstanding quality ; but in fact I find MK switchsockets are competitive on any job."

Illustration is List No. 2784 15 amp. switchsocket-outlet.

MK ...The mark of value

M.K. ELECTRIC LIMITED LONDON N.18 Tel: TOTtenham 5151

L.D.C. 'Fankuld' motors

L.D.C. T.E. Vertical "FANKULD" D.C. Motors 135 H.P. 650/815 r.p.m. at East Greenwich Gas Works.

L.D.C. "FANKULD" T.E. motors are absolutely dust-tight and are particularly suitable for use in dirty, dusty, and fume-laden atmospheres.

All machines are specially insulated and impregnated, fitted with special dust-tight terminal boxes and, if required, can be made weatherproof for use in the open.

LANCASHIRE CRYPTO

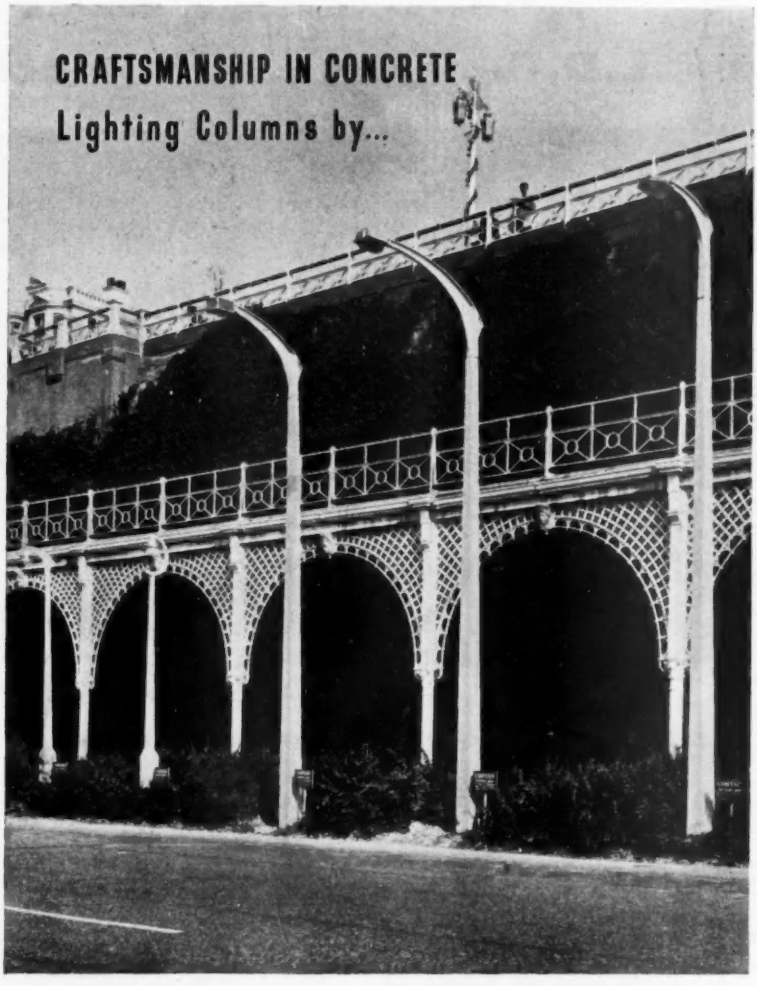
The Symbol of Power in Industry for over 50 years

LANCASHIRE DYNAMO & CRYPTO (MFG.) LTD.

TRAFFORD PARK, MANCHESTER 17. ACTON LANE, WILLESDEN, LONDON, N.W.10

London and Export Office: 94, Petty France, London, S.W.1. **Telephone:** WHI. 7211

M/25

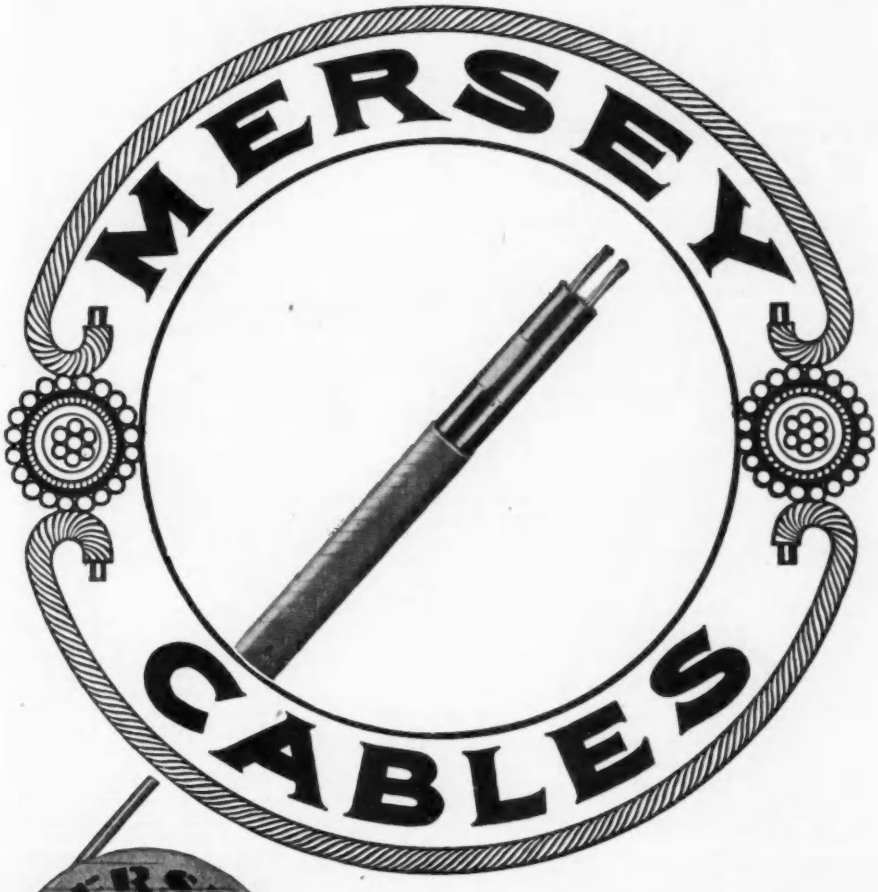


COSTAIN CONCRETE CO. LTD.

An example of one of the many Pre-Stressed Concrete products manufactured

Head Office:
DOLPHIN SQUARE, LONDON, S.W.1 VICTORIA 6624

Works:
BRIDGEND GLAMORGAN, WALES; CHILDERDITCH, ESSEX, ENGLAND; COLTNESS, SCOTLAND



All Sizes of rubber insulated wires, cables and flexibles are made under the famous MERSEY name. *Illustrated is a 3/.036 Flat Twin V.I.R. Insulated, Cotton Taped, Varnished Cambric Taped, Braided and Red Lead Weather Resisting Compounded H.S.O.S Cable. 250 Volt. To B.S. 7/1946.*

MERSEY CABLE WORKS LTD., BOOTLE, LIVERPOOL. *Tel. BOOTLE 4111 (4 lines)*

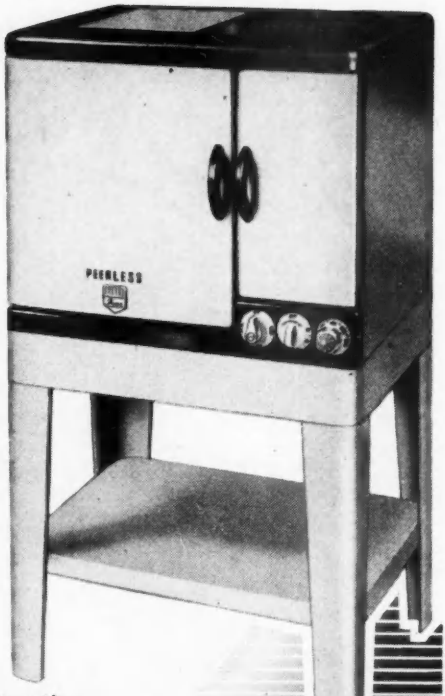
A COMPANY

REVO
REGD.

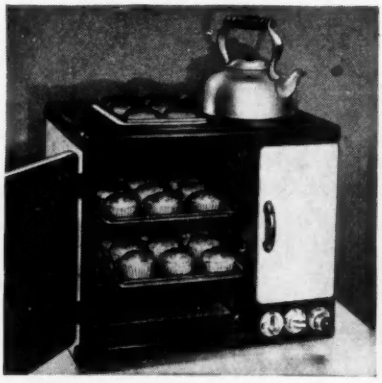
'PEERLESS'

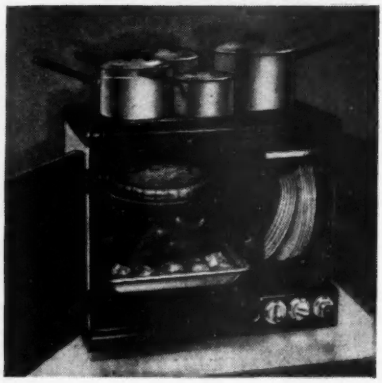
PORTABLE ELECTRIC COOKER

A table cooker of unique qualities, providing the facilities of a full-sized model, but so designed to allow for connection to the electric supply by means of a standard 13- or 15-amp plug. The cooker is finished in black and cream enamel and may be supplied with or without stand.



Attractive full-colour Literature available on request



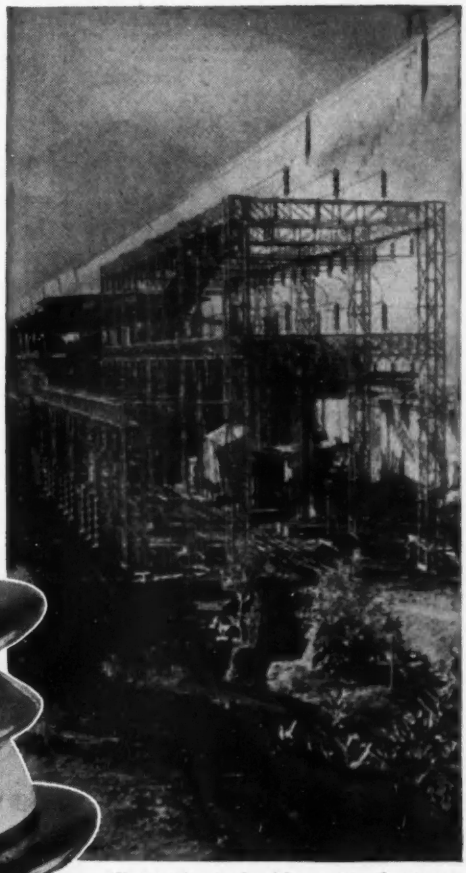


REVO ELECTRIC COMPANY LIMITED, TIPTON, STAFFS

S.P.P.

INSULATORS IN SERVICE

Post Insulators in India



(Photograph reproduced by courtesy of main contractors Messrs. A.E.I. India Limited)

The Mettur Dam sub-station is one of many in South India equipped throughout with Posts of 3 S.P.P. insulator units P.642 and 66kV. and 4 units for 110 kV.

STEATITE & PORCELAIN PRODUCTS LTD.

Stourport-on-Severn, Worcestershire. Telephone: Stourport 111. Telegrams: Steatain, Stourport

SP 82

YOUR PROFITS ARE DWINDLING

all the while you hold up the jobs waiting for delivery of metal conduits.

Goodwill goes too.

GILFLEX CONDUITS

ARE AVAILABLE FROM STOCK

●

Write, 'phone or call :

GILFLEX CONDUITS Ltd.

41 THE PARADE
HIGH STREET

WATFORD, HERTS.

Telephone: Watford 3422

DECO CABLE REELING DRUMS

for all moving structures

DECO Electrical Products include

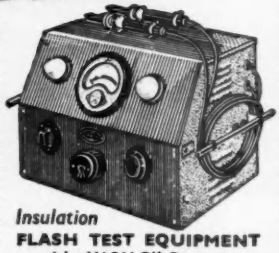
Contact Collector Columns, Limit Switches, Overhead Collector Equipment, Winch Limiting Mechanisms for Skip Hoists, Cranes and Mechanical Handling Plants, Cable Reeling Drums

DECO ENGINEERING CO. LTD.

West Row, N. Kensington, London, W.10 Ladbroke 3066-7

P307

Flash Testing up-to-date



Insulation
FLASH TEST EQUIPMENT
with "VARIAC" Control
Booklet on request

It's a ZENITH *product!*

The ZENITH ELECTRIC Co. Ltd.

Sole makers of the well-known "Zenith" Electrical Products
Zenith Works, Villiers Road, Willesden Green, London, N.W.2
Phone: Willesden 4087. *Grams:* Voltaohm, Norphone, London

S&L

TUBULAR STEEL LIGHTING COLUMNS

Type Gb. 588, 25ft. M.H., for Group 'A' Roads

SUITABLE FOR ELECTRIC LIGHTING

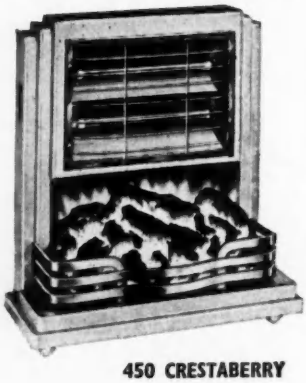
This is one of a series of illustrations indicating our range of standard tubular steel lighting columns, approved by the Council of Industrial Design.
Other designs, plain or fluted, for 13 ft., 15 ft., and 25 ft. mounting heights, will appear from time to time. A folder showing our standard columns will be sent on application.

STEWARTS AND LLOYDS LIMITED

GLASGOW · BIRMINGHAM · LONDON

Electric Fires and Winter

Fuel economy, which in the past few months has provided such a fruitful topic of thought and discussion, is once again a burning question. These summer months have not been wasted, however. A great weight of evidence has been piling up. The case for electric fires no longer rests solely on their cleanliness and convenience — virtues unchallenged by the sternest critics — but on their coal saving properties as well. *Practical tests have shown that for periods up to six hours in even the coldest weather an electric fire uses less coal than the most efficient open grate.* Bearing in mind also the hours of manhandling, gallons of fuel, and vast losses involved in carrying small quantities of coal to millions of different users, the electric fire can rightly be regarded as a national asset in the struggle for fuel solvency.



450 CRESTABERRY

Cold facts for the engineer; warm hearths for the family circle. The CRESTABERRY, latest edition to the Magicoal range, has pleasingly modern lines and a particularly cheering fire effect. Equipped with a special safety guard, it is finished in Warm Silver with polished rustless feet, front bars and radiant heat reflectors. Two 1kW. elements are controlled independently by recessed switches.

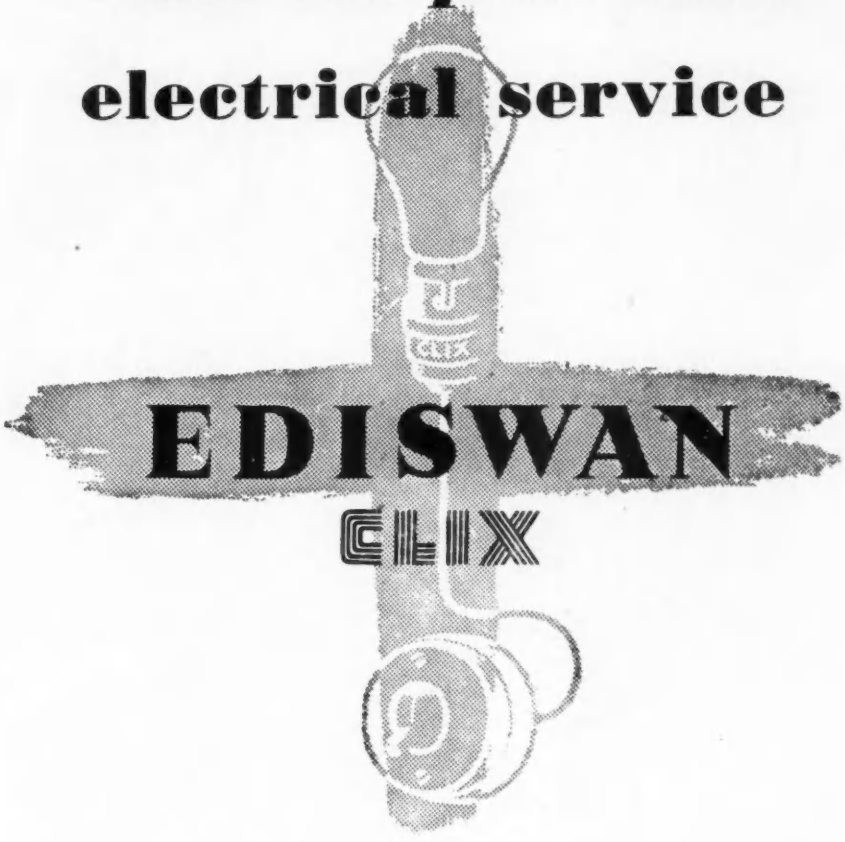
Berry's

MAGICOAL

ELECTRIC FIRES

BERRY'S ELECTRIC LIMITED · TOUCHBUTTON HOUSE · NEWMAN STREET · LONDON · W·1

Puts the *plus* into electrical service



An event of paramount importance to all concerned with electrical installation is the taking over by The Edison Swan Electric Co. Ltd. of Clix and Genacco electrical accessories. Everything required for a highly efficient service—lamps, lighting fittings, cables and accessories—can now be supplied by The Edison Swan Electric Co. Ltd. Bear this in mind when planning new installations or modernising existing ones.

THE EDISON SWAN ELECTRIC COMPANY LIMITED
155 Charing Cross Road, London, W.C.2 and branches

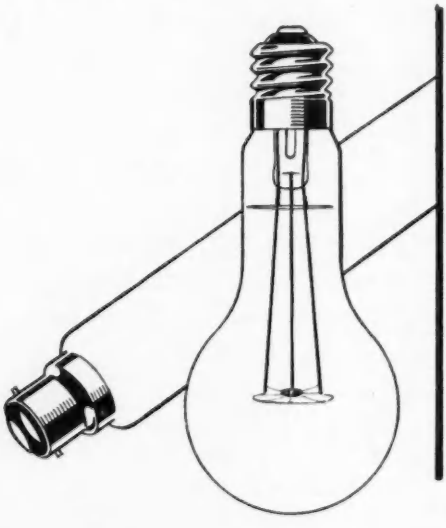
Member of the A.E.I. Group of Companies

ES
B

Switch to

Crompton *LAMPS*

for every industrial purpose



Here's why

What you get out of a lamp depends on what is put into it. In Crompton lamps this means the best material, tested at every stage of manufacture and backed by lighting experience that spans nearly 75 years.

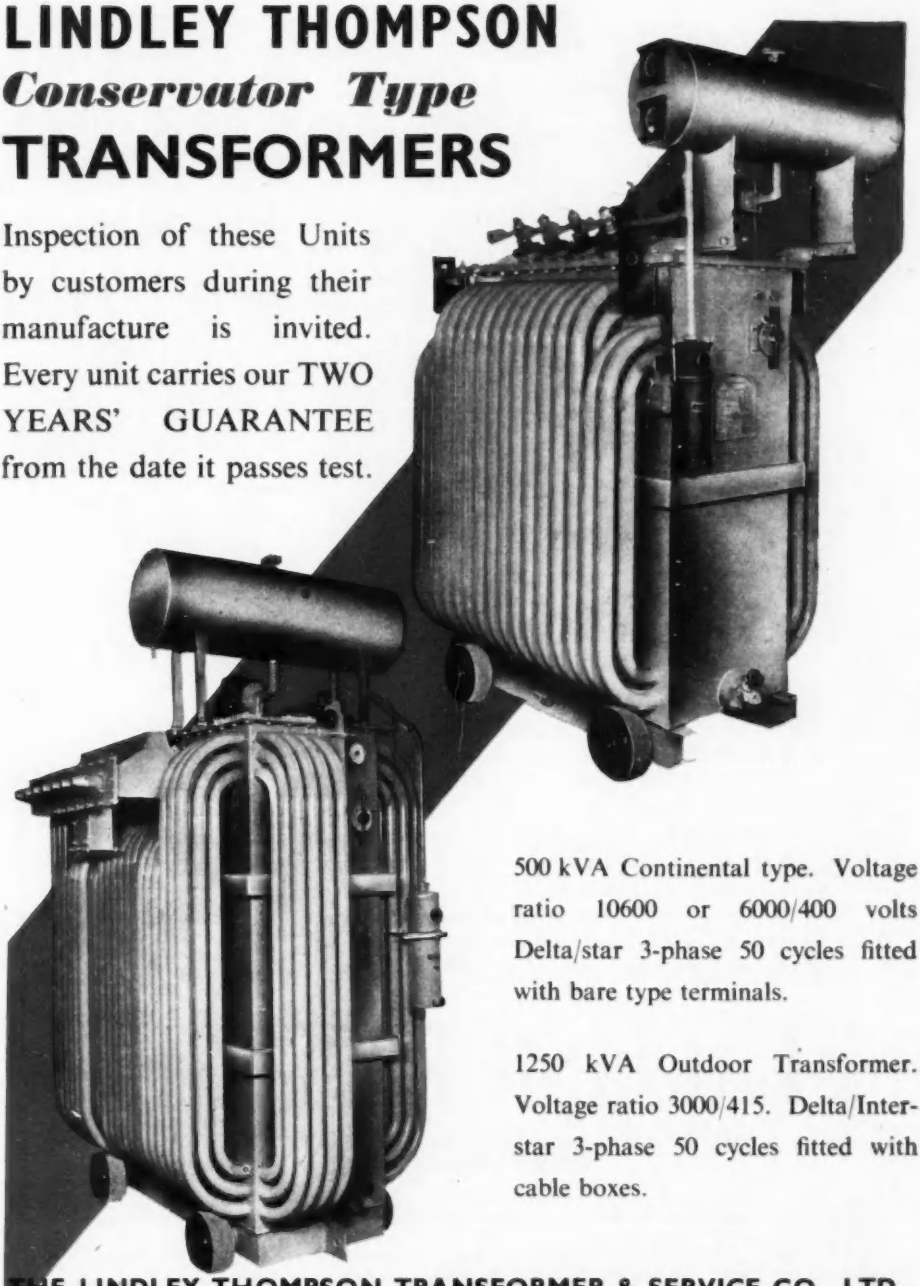
That is why you get full light output for a long life from Crompton lamps.

BY APPOINTMENT
MANUFACTURERS OF ELECTRIC LAMPS
TO THE LATE KING GEORGE VI

CROMPTON PARKINSON LIMITED, CROMPTON HOUSE, ALDWYCH, LONDON, W.C.2
Telephone: CHAncery 3333 *Telegrams: Crompark, Estrand, London*

LINDLEY THOMPSON
Conservator Type
TRANSFORMERS

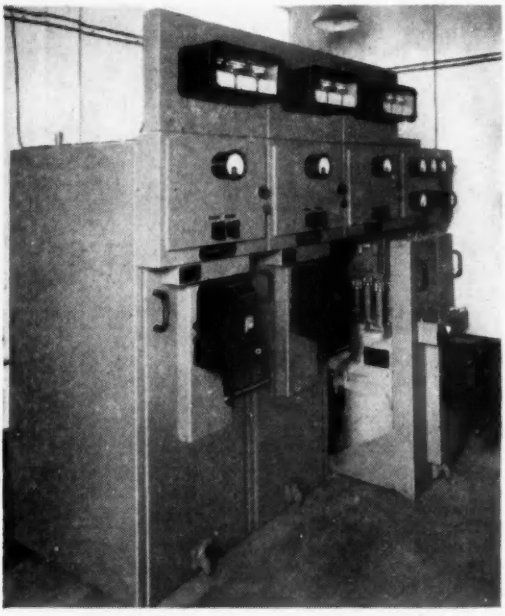
Inspection of these Units by customers during their manufacture is invited. Every unit carries our TWO YEARS' GUARANTEE from the date it passes test.



500 kVA Continental type. Voltage ratio 10600 or 6000/400 volts Delta/star 3-phase 50 cycles fitted with bare type terminals.

1250 kVA Outdoor Transformer. Voltage ratio 3000/415. Delta/Inter-star 3-phase 50 cycles fitted with cable boxes.

THE LINDLEY THOMPSON TRANSFORMER & SERVICE CO., LTD.
ST. MARY'S ROAD · MIDDLE GREEN · SLOUGH · BUCKS · Tel. Langley (Bucks) 200/201



High voltage distribution up to 11 kV

Designed for electricity supply authorities and industrial consumers, 'ENGLISH ELECTRIC' type OLX air-insulated, oil circuit breakers are available up to 800 amps rating. They are A.S.T.A. certified for breaking capacities up to and including 250 MVA at 6.6 and 11kV.

The type OLX switchboard illustrated is installed at the Neston Works of the Morgan Crucible Co. Ltd. Unit construction ensures easy extension, while all parts of similar pillars are interchangeable. Circuit breakers and oil switches can be arranged in any combination.

'ENGLISH ELECTRIC' type OLX circuit breakers are designed for safe and consistent operation, for reliability under all conditions of service with the minimum initial cost.

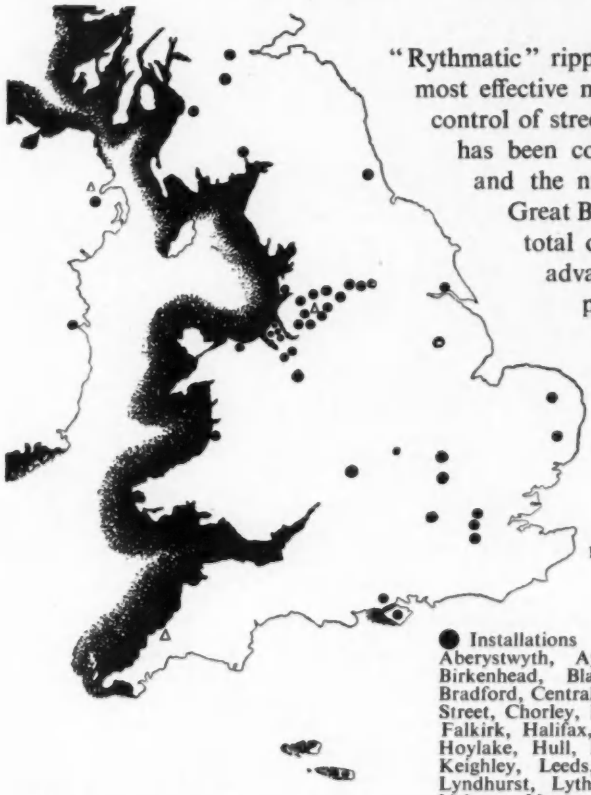
'ENGLISH ELECTRIC'
switchgear

THE ENGLISH ELECTRIC COMPANY LTD., QUEENS HOUSE, Kingsway, London, W.C.2
Switchgear Department, Liverpool

WORKS: STAFFORD · PRESTON · RUGBY · BRADFORD · LIVERPOOL · ACCRINGTON

SL.6

The people who know most about ripple control — SPECIFY RYTHMATIC ★ FOR STREET LIGHTING CONTROL



"Rythmatic" ripple control has proved the most effective method for the centralized control of street lighting. Its application has been continuous and widespread and the number of installations in Great Britain exceed the combined total of all other systems. The advantage of the "Rythmatic" principle is that a single frequency only provides the required number of signals. Injection equipment and control relays are simple in design, resulting in negligible maintenance requirements.

● Installations are already operating at Aberystwyth, Ayrshire, Banstead, Bedford, Birkenhead, Blackburn, Bletchley, Bolton, Bradford, Central London, Chester, Chester-le-Street, Chorley, Dublin, Dumfries, Dunstable, Falkirk, Halifax, Hawarden, High Wycombe, Hoylake, Hull, Isle of Wight, Jersey (C.I.), Keighley, Leeds, Leyton, Lincoln, Lisburn, Lyndhurst, Lytham St. Annes, Motherwell, Nelson, Newton-le-Willows, Norwich, Port Sunlight, Radcliffe, Rhyl, St. Helens, Wallasey, Wigan, Wolverton.

△ *In process of manufacture for Belfast, Rawtenstall and West Cornwall.*

AUTOMATIC TELEPHONE & ELECTRIC CO. LTD.

Strowger House, Arundel Street, London, W.C.2 Telephone: TEMple Bar 4506.
Telegrams: Strowger, Estrand, London. Strowger Works, Liverpool, 7.

★ 'RYTHMATIC' *is the registered trade mark of Automatic Telephone & Electric Co. Ltd.*

A.3523 - A23

the great masters

Ludwig Van Beethoven (1770-1827)
There is hardly a great man in history of whom more is known, and of whom so much of what is known is interesting. His life though outwardly uneventful, was one of the most pathetic of tragedies, through which noble character and high moral ideals of a man exposed to the growing shadow of a terrible misfortune, emerge with the pure radiance of the great music he created ; the man surpassed only in his own works. On March 26th, 1827, during a fierce thunderstorm, he died, leaving a world of music that will hold a central place in the minds of men, who are not afraid to experience the drama and sublime emotion of life.

The name " Taylor Tunnicliff " has become synonymous with all manner of high quality ceramics serving the electrical and electronic industries of our own age.

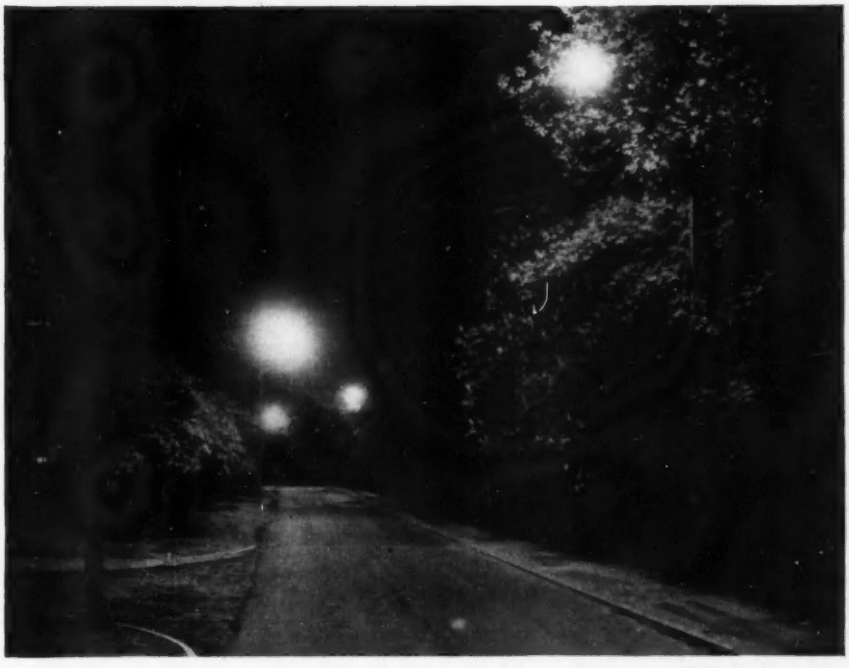
Taylor Tunnicliff & Co., Ltd.

Masters of Porcelain Insulation

MAKERS OF FINE PORCELAIN FOR HIGH VOLTAGE INSULATION AND CERAMICS OF EVERY DESCRIPTION FOR RADIO · TELEVISION & THE ELECTRICAL INDUSTRIES

HEAD OFFICE : EASTWOOD · HANLEY · STAFFS · Stoke-on-Trent 5272/4
LONDON OFFICE : 125 HIGH HOLBORN · W·C·1 · Holborn 1951/2

SIEMENS *for leadership in Modern Street Lighting*



Class "A" sodium lighting has been brought into service in the New Town of Bracknell, utilizing the new Siemens sealed drum refractor lanterns with Sieray 140 Watt sodium lamps and control gear

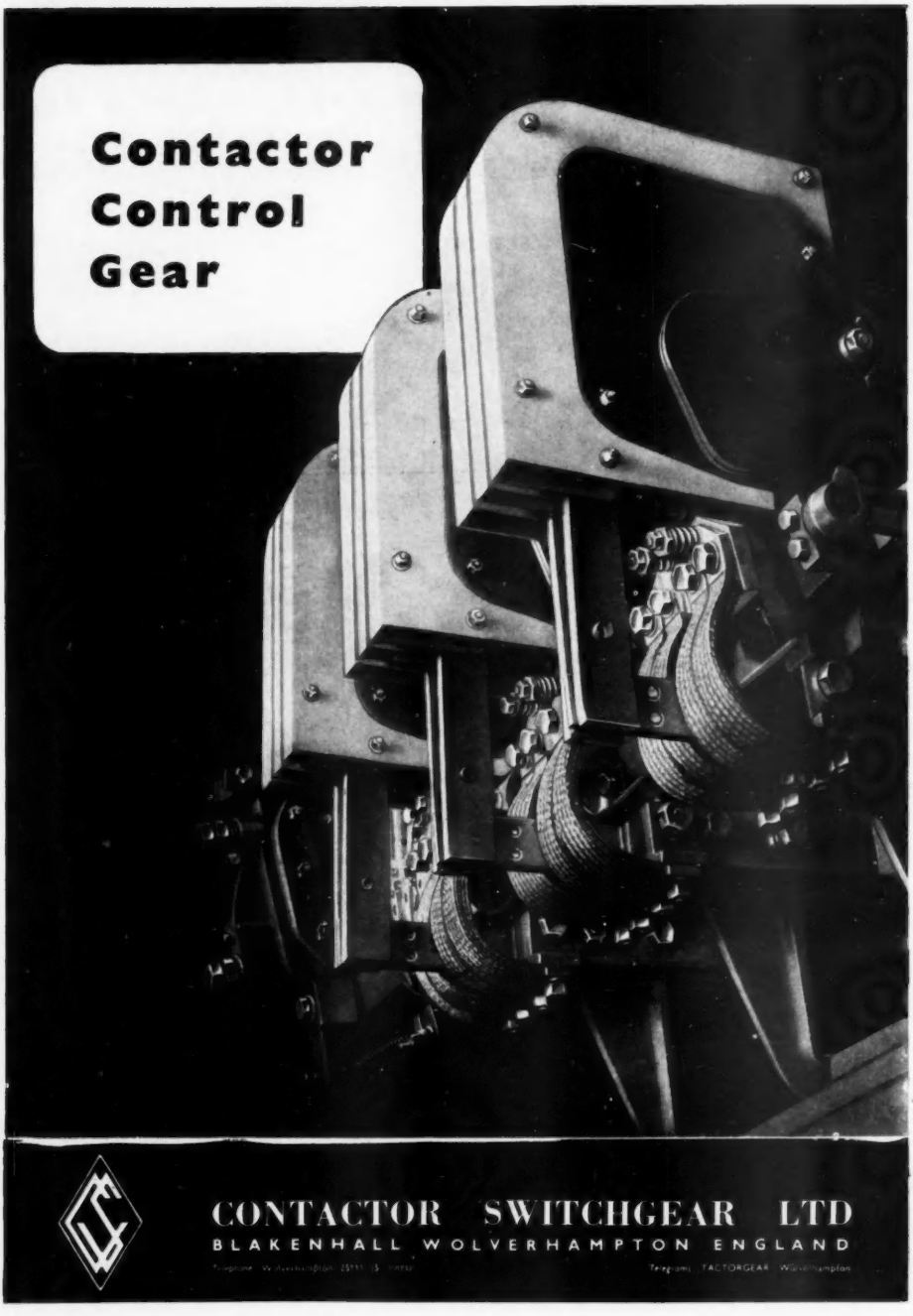
SIERAY

LAMPS FITTINGS AND CONTROL GEAR

Our Street Lighting Engineers will gladly co-operate in preparing complete schemes and advising as to the best type of equipment to use

Advt. of **SIEMENS ELECTRIC LAMPS AND SUPPLIES LIMITED, 38/39 Upper Thames Street, London, E.C.4**

Branches: Belfast, Birmingham, Bristol, Cardiff, Dublin, Edinburgh, Glasgow, Leeds, Liverpool, Manchester, Newcastle, Nottingham, Sheffield



CONTACTOR SWITCHGEAR LTD
BLAKENHALL WOLVERHAMPTON ENGLAND
Telephone Wolverhampton 25111 (5 lines)
Telegrams TACTORGEAR Wolverhampton

Catalogue No. P.3712

BRITMAC

ILLUSTRATIONS:

"Industrial" Ironclad switch and socket assembly and switch plug unit. Catalogue Number P.3712. Available for vertical or horizontal mounting.
Catalogue Number P.1402 arranged for horizontal mounting only.
Both types are obtainable in 2, 5 and 15 amp. sizes.

the points in favour . . .

QUALITY:

Throughout the whole range of BRITMAC Electrical Accessories—the testing of raw materials—the continual research into improved methods of manufacture—the rigorous inspection at all stages of production—ensure the Highest Standard of Quality and Finish.

Catalogue No. P.1402

. . . at every point — "BRITMAC"

BRITMAC ELECTRICAL CO. LTD

SALES ORGANISATION OF C. H. PARSONS LTD

HEAD OFFICE · BRITANNIA WORKS · WHARFDALE ROAD · TYSELEY · BIRMINGHAM · 11

Telephone: ACOCKS GREEN 1191 (3 lines) · Telegrams: "BRITMAC, BIRMINGHAM"

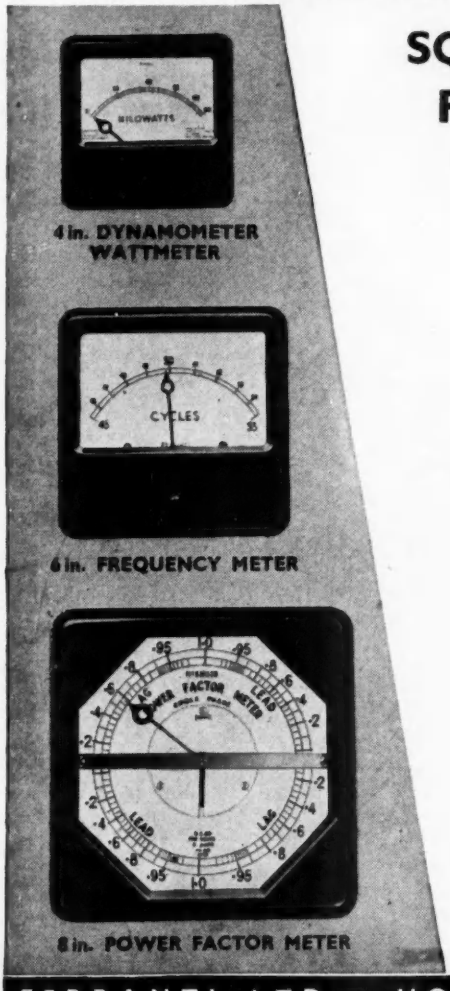
London Office:
121, VICTORIA ST., S.W.1
Telephone: VICTORIA 9778/9

Glasgow Office:
247a, ST. VINCENT ST., & 93, DOUGLAS ST., C.2
Telephone: CENTRAL 3445/6

SM/BE. 498b

FERRANTI

SWITCHBOARD INSTRUMENTS



SQUARE PATTERN *for* FLUSH MOUNTING

easy circular hole panel fixing

DIALS

4", 6" and 8"

Open or Protected

TYPES:

Moving coil and moving iron ammeters and voltmeters. Dynamometer Wattmeters. Power Factor Meters. Induction Wattmeters. Frequency Meters. Synchroscopes. Synchronous Clocks.

Round patterns, projecting or flush, also supplied in above sizes and types.

Write for descriptive lists.

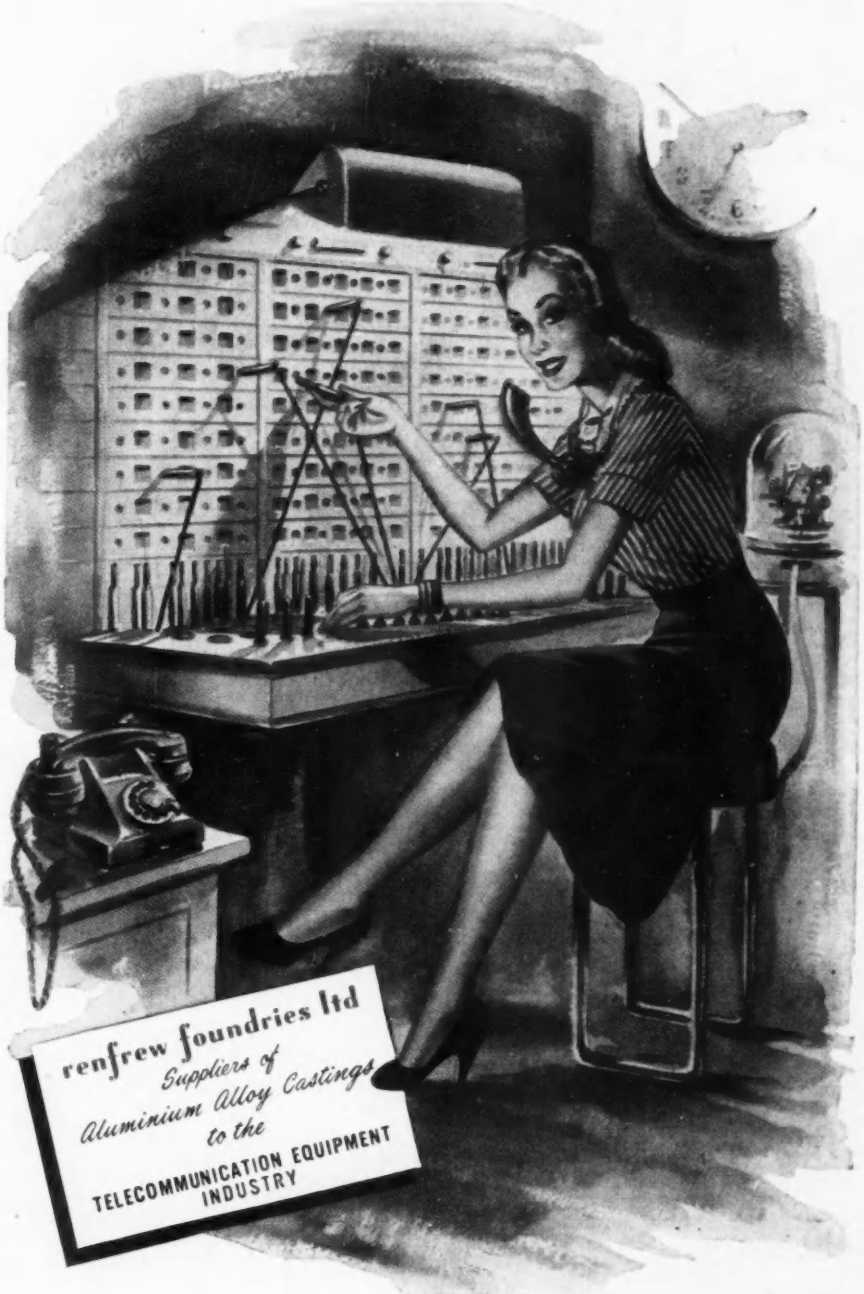
WINGS DAY
SEPT 20th
Give for those who Gave

FERRANTI

FERRANTI LTD · HOLLINWOOD · LANCS

London Office: KERN HOUSE, 36 KINGSWAY W.C.2

F 100


renfrew foundries ltd
Suppliers of
Aluminium Alloy Castings
to the
TELECOMMUNICATION EQUIPMENT
INDUSTRY

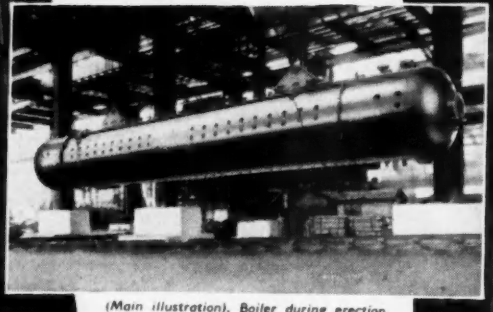
LARGEST IN GREAT BRITAIN

Stirling BOILERS AT KEADBY

The Stirling Boiler Company has always played an outstanding part in the equipment of the world's power stations, but it is particularly proud that the Stirling boilers at the new Keadby station of the British Electricity Authority are the **largest capacity boilers in Great Britain.**

Following the modern practice of one boiler per turbine, each of the six Stirling units, rated at 550,000 lb./hr. at 925 lb./sq. in. and 915°F., will steam a 60,000 kW turbo generator. These boilers are of the Radiant type, with twin furnaces, pulverised fuel fired by vertical burners supplied from "E" type pulverising mills.

Consulting Engineers:
Ewbank & Partners, Ltd.



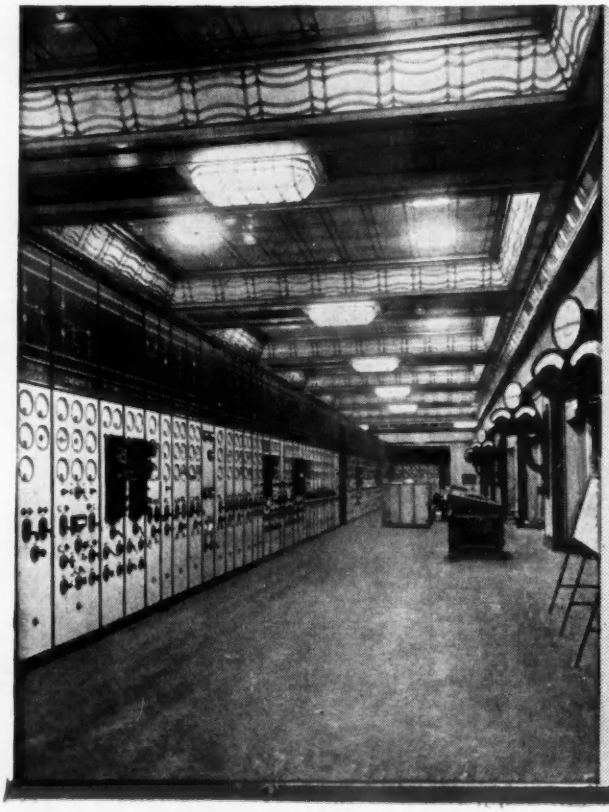
(Main illustration). Boiler during erection showing the walls of the superheater chamber (Inset illustration). Lifting the 65 ton fusion-welded steam drum for one of the Stirling boilers at Keadby.

THE STIRLING BOILER COMPANY LIMITED

34-36 FARRINGDON STREET · LONDON E·C·4

THE GENERAL ELECTRIC CO. LTD., MAGNET HOUSE, KINGSWAY, LONDON, W.C.2.

The HOLOPHANE System of Illumination at Battersea Power Station



This night photograph of the reconstructed and enlarged control room at Battersea Power Station was taken solely by the light of the Holophane "In-Bilt" units.

Engineers with specific lighting problems are invited to consult the Holophane Technical Service Department.

Photo by courtesy of B.E.A.

HOLOPHANE LIMITED

Scientific Illumination Experts

ELVERTON STREET, VINCENT SQUARE, LONDON S.W.1

Telephone: VICtoria 8062 (4 lines) Telegrams: HOLOPHANE SOWEST LONDON

Absolute reliability

Service . . . . . .

Consistent quality .

Maximum satisfaction

Symbolised by

A.S.C.M. MEMBERS

ARE AS FOLLOWS:

ALMA & CRANMORE TUBE CO. LTD.
BARLOW, H. J. & CO. LTD.
ELECTRICAL CONDUITS LTD.
GENERAL ELECTRIC CO. LTD.
GRIFFITHS, ISAAC & SONS
HILDICK & HILDICK
McDOUGALL, JAMES LTD.
METALLIC SEAMLESS TUBE CO. LTD.
MONMORE CONDUITS LTD.
SIMPLEX ELECTRIC CO. LTD.
Comprising:
Credenda Conduits Co. Ltd.
Perfecta Tube Co. Ltd.
Simplex Conduits Ltd.
Stella Conduit Co. Ltd.
STEEL TUBE & CONDUIT CO. (Middlesbrough) LTD.
TALBOT-STEAD TUBE CO. LTD.
WALSALL CONDUITS LTD.

MADE IN ENGLAND
APPROVED & CERTIFIED
A.S.C.M
BRITISH STANDARD

Advertisement of the
ASSOCIATION OF STEEL CONDUIT MANUFACTURERS
21, WATERLOO ST · BIRMINGHAM

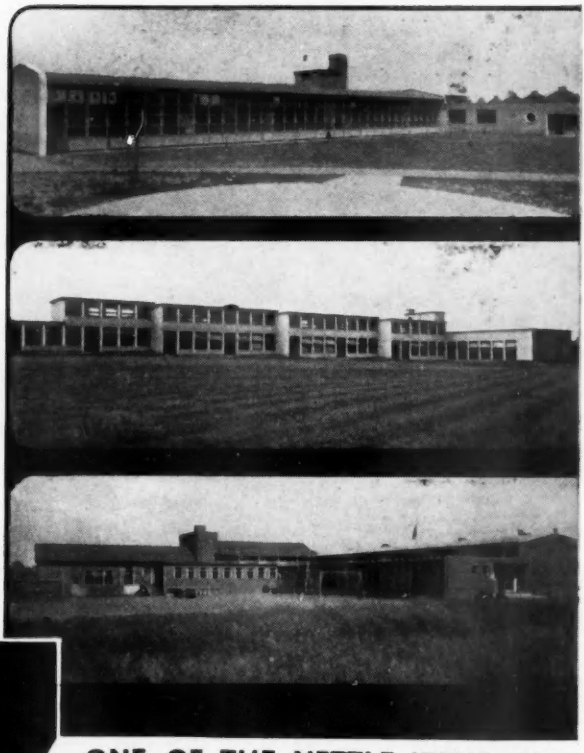
NEW SCHOOLS

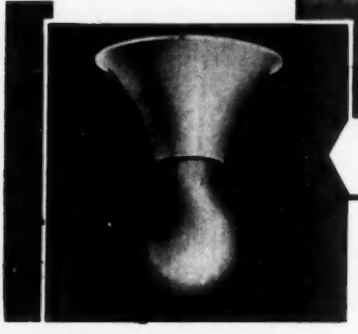
NETTLE LENDS A HAND!

Wentworth County Primary School, Dartford. Architect. S. H. Loweth, Esq., F.S.A., F.R.I.B.A. Consultants: J. Stinton Jones and Partners. Builders: Gilbert Ash Ltd. Electrical Contractors: Francis Folden and Co. Ltd.

Grays Farm County Primary School, Chislehurst and Sidcup. Architect: Scott and Westmoreland in collaboration with S. H. Loweth, Esq., F.S.A., F.R.I.B.A. Consultants: J. Stinton Jones and Partners. Builders: E. H. Smith (Croydon) Ltd. Electrical Contractors: C. W. Gosling Ltd.

The Highway County Primary School, Orpington. Architect: O. E. Steer, Esq., in collaboration with S. H. Loweth, Esq., F.S.A., F.R.I.B.A. Consultants: J. Stinton Jones and Partners. Builders: Gilbert Ash Ltd. Electrical Contractors: Phoenix Electrical Co. Ltd.



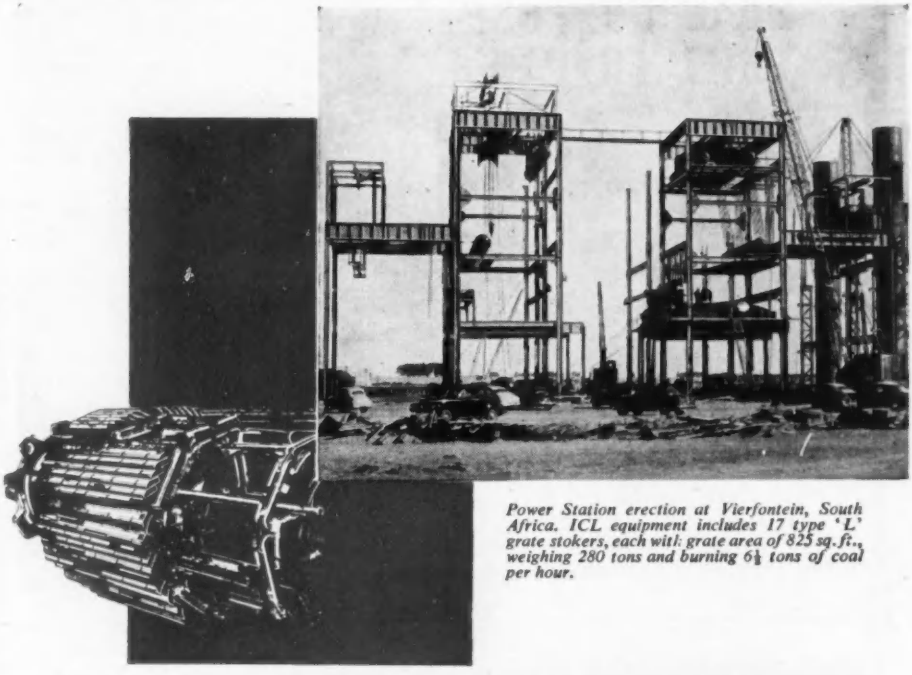


ONE OF THE NETTLE ITEMS USED
REF. 50W. - - CEILING FITTING

We are manufacturers of a wide range of Shockproof Electrical Wiring Accessories. Descriptive leaflets will be sent upon request.

NETTLE ACCESSORIES LTD.

HARPER RD. WYTHENSHAWE MANCHESTER



Power Station erection at Vierfontein, South Africa. ICL equipment includes 17 type 'L' grate stokers, each with grate area of 825 sq. ft., weighing 280 tons and burning 6½ tons of coal per hour.

IN TWO HEMISPHERES

FEATURES OF THE TYPE 'L' STOKER

- Close control of air supply gives even burning; allows fuels of widely varying characteristics to be used efficiently.
- Automatic cleaning of louvre fire bars, which are free to grow without affecting efficiency.
- Parts requiring attention are easily accessible and renewable with minimum interference to stoker operation.
- Stoker chains are distinct from grate surface so that each is free to perform its own function.

Since 1926 when the type 'L' Louvre Stoker was introduced it has been used in seventeen countries and fitted to over twenty types of boiler. Now South African manufacture augments Home and Australian production.

INTERNATIONAL COMBUSTION LIMITED

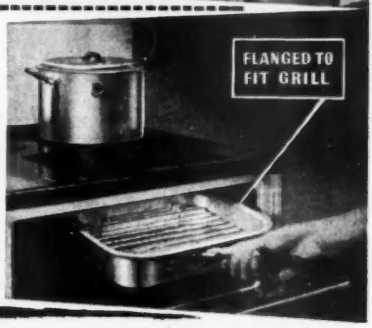
ICL

LONDON OFFICE: NINETEEN WOBURN PLACE, W.C.1

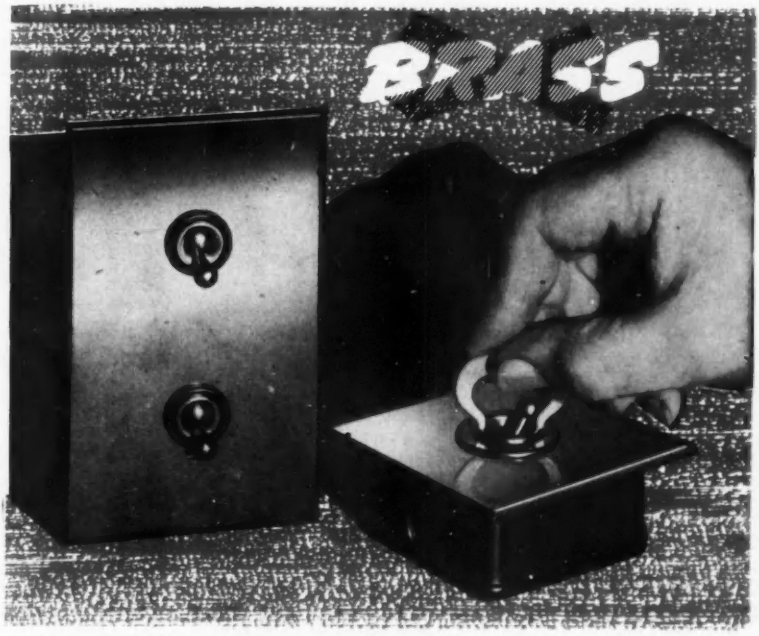
Works: *DERBY, ENGLAND; PORT ELIZABETH, SOUTH AFRICA; SYDNEY, AUSTRALIA*

DUAL PURPOSE GRILL FRYPAN

The new Pyramid dual purpose grill-frypan fits any standard post-war grill. With wire grid it is an efficient and enduring grill pan—while the Pyramid special construction gives it a ¼ in. thick base, guaranteed against distortion and making it an admirable frypan. Thus, one pan does the work of two.
This is the first pan specially designed to meet the needs of those good cooks who first grill and then fry in order to economise in both fat and time.
The grill-frypan has wide corners for easy cleaning and is fitted with the special PYRAMID heat-resisting and insulated Bakelite handle.



PYRAMID
ALUMINIUM WARE for ELECTRIC COOKING
HAGUE & McKENZIE LTD
PYRAMID WORKS, BIRMINGHAM 1



Alternative METAL PLATES

Aluminium plates—a licence-free alternative to brass plates—are available in a wide variety of patterns. These include ring- and two-screw fixing types; and plates for corner fixing, locking rings and other special applications. The two finishes are "anodised natural" and "anodised B.M.A."

CRABTREE

A name synonymous with Progress in Accessories and Switchgear

"Crabtree" (Registered) *C.660/142 Advt. of J. A. Crabtree & Co. Ltd., Walsall, Staffs, England*

STERLING

Featherweight

● **"ALUPLAS"** is an entirely new phase of electric cable manufacture embodying accepted modern materials and methods.

● **"ALUPLAS"** has a conductor of Aluminium which, increased in area by approximately 1.65 times, is equal in conductivity to high grade electrolytic copper.

● **"ALUPLAS"** has an insulation of Poly-ethylene, already accepted as superior to Vulcanised Rubber.

● The mechanical protection can be suited to varying requirements but normally consists of one cotton braid heavily impregnated with Bitumen Compound.

ALUPLAS

STERLING
CABLE COMPANY LIMITED ALDERMASTON BERKSHIRE
MANUFACTURERS OF ELECTRIC CABLES
Telephone: READING 1000 · Telegrams: STERLING PHONE READING · Cablegrams: STERLING PHONE READING ENGLAND

Scarab mouldings are mechanically strong. They are good insulators and are highly resistant to tracking. Scarab moulding powder is inexpensive, easy to mould and is supplied in black, brown and a wide range of attractive colours. There is a special plasticised grade with low after-shrinkage for moulding around heavy inserts. Write for technical leaflets. Standard Scarab moulding powder conforms to B.S.1322, Type U.

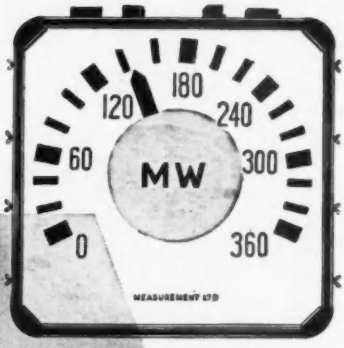
B·I·P GROUP

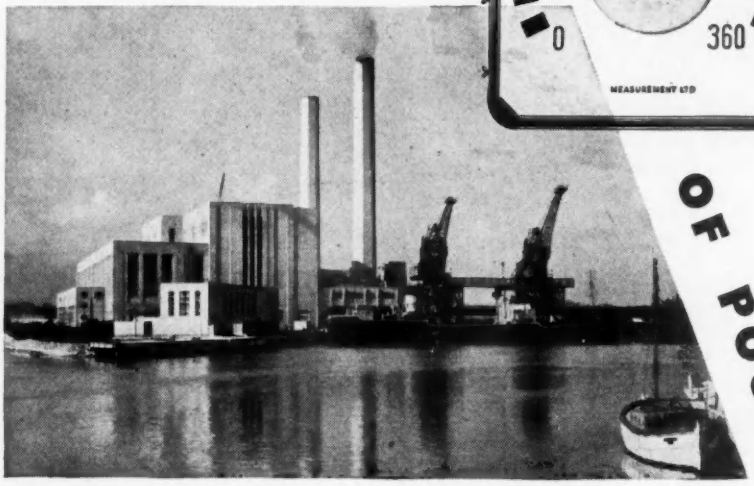
The Beetle Products Company Ltd.

1 Argyll Street, London, W.1

Scarab *is a trade mark registered in Great Britain and in most countries of the world*

THE PULSE OF POOLE





Boiler room. Turbine room. Control room. The men at the controls need a perpetual finger on the pulse . . . a constant knowledge of the station's load. At Poole, and in other power stations all over the country, B.E.A. has installed Measurement Telewattmeters with mammoth load indicators —30″ and larger, single or double sided, with or without internal illumination. Easy to read and easy to maintain, giving a lifetime of service.

meters are matters for

MEASUREMENT

MEASUREMENT LTD., Remote Control Division, 7/17 Fitzalan Street, Kennington, London, S.E.11
Electricity Meter Div., Tameside Works, Dobcross, Nr. Oldham, Lancs.
Hydraulics Division, 119 Union Street, Oldham, Lancs. *A Company of the Parkinson & Cowan Group*

Spotlight on Quality

ELEPHANTIDE

REGD.

ELECTRICAL INSULATING PRESSBOARD

BRITISH MADE BY

B. S. & W. WHITELEY LTD.

POOL - IN - WHARFEDALE, YORKS.

Tel: Arthington 98 & 99 Grams: Whiteley, Pool - in - Wharfedale

LONDON OFFICE

104 HIGH HOLBORN, W.C.1 Tel: CHAncery 7646

present 'a new star'

IN THE LEWCOS RANGE

★ **LEWMEXBOND** (REGD)

(SELF-BONDING LEWMEX)

LEWMEXBOND consists of standard Lewmex Wire with an additional covering of thermoplastic material.

Self-supporting coils of almost any required shape may be produced by the simple application of heat to the wound coil whilst still on the former. When, after cooling, the coil is removed from the former, the bonding of the thermoplastic material on adjacent turns produces a rigid unit which does not require taping or other external support.

In inviting your inquiries for this and other LEWCOS products, we offer the co-operation of our Technical Service.

THE LONDON ELECTRIC WIRE COMPANY AND SMITHS, LIMITED
LEYTON, LONDON, E.10.
Incorporating FREDERICK SMITH AND COMPANY
Associated with THE LIVERPOOL ELECTRIC CABLE CO., LTD., AND VACTITE WIRE CO., LTD.

and now—

the

SUNVIC

one-circuit radiant

boiling plate

and the Simmerstat

the inevitable answers to

Lower first costs
Lower maintenance costs
Lower consumption
Perfect performance for all cooking needs

Sunvic one-circuit Radiant Boiling Plates are available in 6¼" and 8" sizes. Ask for leaflet BP.10

SUNVIC CONTROLS LTD. SUNVIC HOUSE, 10 ESSEX STREET, LONDON, W.C.2
Member of the A.E.I. Group of Companies
Sales and Enquiries: 132/5 Long Acre, London, W.C.2

Testing is easier....

with C & H Test Terminal Blocks because of their convenience, reliability and compactness. Chamberlain and Hookham All Insulated Test Terminal Blocks are favoured by Testing Engineers all over the world.

Particulars of the types available and their ranges of application will be forwarded on request.

Chamberlain AND Hookham

TEST TERMINAL BLOCK

CHAMBERLAIN AND HOOKHAM LTD., BIRMINGHAM

Remote Control Desk for group motor starting with indicator lamps.
A variety of arrangements is available to suit individual requirements.
Type DO.75 Single Pillar motor starter showing accessibility of interior (isolator shield removed).
Type M.150 Contactor Unit, suitable for direct mounting on Capacitor tank for power factor correction.
Pillar-type motor starter incorporating three direct-on starters and one stator rotor starter arranged for automatic sequence control and fitted with isolating switch.
22-Unit Double Tier motor control switchboard comprising 300 amp. incoming switch and fuse unit, and contactors catering for various duties up to 100 h.p.
AIR BREAK
ELECTRIC MOTOR CONTROL GEAR
FOR INDUSTRIAL APPLICATION
(Up to 650 volts A.C.)
Single Tier motor control switchboard with individual isolation, ammeters and arranged for local push-button control.
the Belmos company limited
BELLSHILL
LANARKSHIRE
BELMOS

LONDON OFFICE: COLUMBIA HOUSE ALDWYCH, LONDON, W.C.2

THE SWITCH

You can rely on!

Wylex

SWITCHES

20 *amp*, 30 *amp* & 60 *amp*

Write for Catalogue :—

Wylex Switch was tested to far beyond normal use, up to 100,000 Makes and Breaks. Designed on modern principles, it has proved itself over the years, and today is famous.

GEORGE · H · SCHOLES & CO · LTD

Wylex Works · Wythenshawe · Manchester

More power means more prosperity

TODAY THE prosperity of any country is directly dependent on the amount of electrical power available. The M.-V. organization by supplying steam, hydro-electric and gas-turbine power plant for power stations at home and abroad is making an important contribution to world prosperity.

The above photograph shows the Pitlochry station on the Tummel-Garry scheme of the North of Scotland Hydro-electric Board, containing two Metrovick 8,333 kVA. generators. Other M.-V. equipment, including switchgear and transformers, is assisting the latest industrial developments in Scotland.

METROPOLITAN-VICKERS ELECTRICAL CO. LTD. • MANCHESTER 17

Member of the A.E.I. group of companies

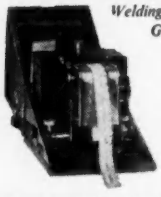
METROVICK *electrical equipment for hydro-electric schemes*

C/W101

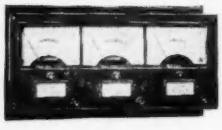
Some other instruments...

Battery Charge Indicator

Neutral Displacement Relay



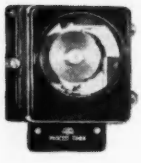
Welding Cycle Grapher



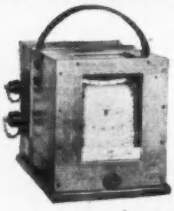
3-phase High Speed Maximum Reading Ammeter

500kV Electrostatic Voltmeter

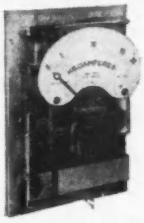
Marine Type Overload Relay



"Weathering Test" Cycle Controller



Railway Speed Grapher



Welding Current Peak Ammeter

H. F. Output Meter

...from

EVERETT EDGCUMBE

Makers of electrical instruments for indicating, recording and controlling; photometric apparatus; process controls.

COLINDALE WORKS LONDON N.W.9 TEL.: COLINDALE 6045

DHB

"All my life, I've insisted on TUCKER
—60 years' tradition is YOUR guarantee"

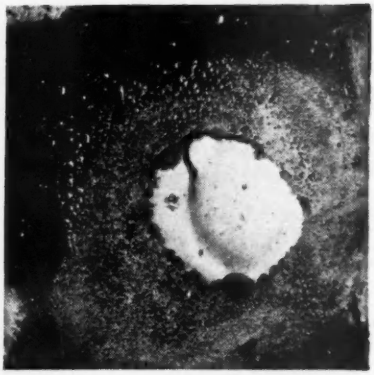
Tucker TELAC
1892 = 1952
DIAMOND JUBILEE

J. H. TUCKER & CO. LTD., Kings Rd., Tyseley, Birmingham 11

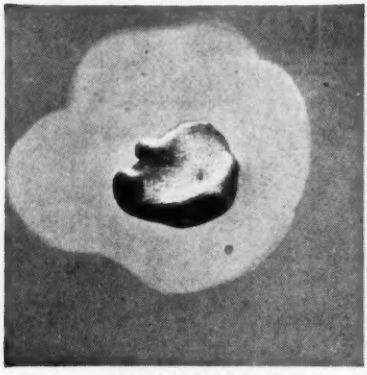
London Office: 2, Newman Street, W.1

Alcho-re fluxes REALLY ARE NON-CORROSIVE

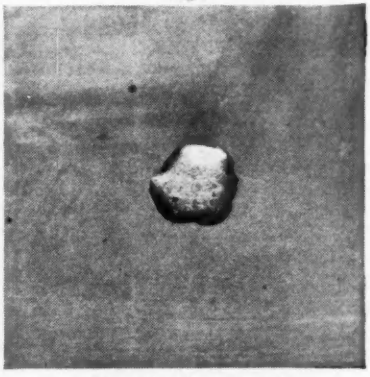
Residue from Alcho-re after three months



Residue from ordinary flux after three days



Fluxed with Alcho-re



Fluxed with plain resin

Spread of solder on copper

Alcho-re fluxes REALLY ARE NON-CORROSIVE

The term non-corrosive is applied to Alcho-re fluxes because they have passed the strict tests of our Research Department and have the official approval of A.I.D., M.O.S., A.M., etc. The superiority of the Alcho-re fluxing has been endorsed not only by scientific tests but throughout industry where freedom from corrosion is essential.

Export enquiries also welcome.

A.I.D. APPROVED ORGANISATION

FRY'S METAL FOUNDRIES LIMITED

TANDEM WORKS · MERTON ABBEY · LONDON SW19 · MITCHAM 4023

and at MANCHESTER, GLASGOW, BRISTOL, BIRMINGHAM AND DUBLIN

ELECTRICAL TIMES

Vol. 122 No. 3176 THURSDAY, 18 SEPTEMBER, 1952

PUBLISHED EVERY THURSDAY

SIXTY-FIRST YEAR OF PUBLICATION

SUPPLY FOR TOBAGO *by K. W. Finch* 481

FUEL AND THE FUTURE 483

PLANT STIMULATION BY LIGHT 486

NOTES ON WIRING, *by Megohm* 487

A.P.L.E., 1952—LIGHTING AND SAFETY 488

A.P.L.E. CONFERENCE EXHIBITION 492

ADMIRALTY ENGINEERING 497

BORING THROUGH CONCRETE 498

PROBLEMS AND PRACTICE IN ENGINEERING 499

THE NEVITRON IS NEW! 500

POWER PLANT MADE IN CHINA 501

OVERSEAS NEWS 502

PERSONALITIES IN THE INDUSTRY 504

PRESIDENT AND CHAIRMEN FOR THE 1952-53 SESSION OF THE I.E.E. 506

NEW LITERATURE 508

THE BUYER'S COLUMN 509

POWER SUPPLY IN AUGUST 511

THE WEEK IN NEWS 512

Electric Supply News 517

Company Activities 518

COMMERCIAL INFORMATION 519

CLASSIFIED ADVERTISEMENTS 57

INDEX TO ADVERTISERS 64

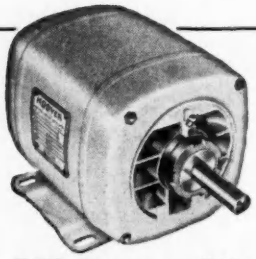
SUBSCRIPTION RATES.—United Kingdom and Overseas £2 10s. 0d. per annum. Canada C$7·50c., U.S.A. $7·50c. per annum. Subscriptions are payable in advance and may commence with any issue throughout the year. Overseas subscriptions may be paid to The Electrical Times Limited by banker's draft, cheque or international money order. Single copies 9d. each

OFFICES — SARDINIA HOUSE, SARDINIA STREET, LONDON, W.C.2

Telephone - HOLborn 6016 Telegrams - Equivolt, Estrand, London

Man behind the headlines

THE skill and accuracy of the men who set the headlines and operate the type-setting machines are vital to that modern miracle, high-speed newspaper production. This exacting task must be carried out with precise efficiency, with no hint of fuss or flurry. It is the same with an F.H.P. motor — and for that reason the Hoover motor is a world-wide success. In this Hoover 'fractional' thousands of manufacturers have found a smooth, quiet, ever-dependable source of power that gives them years of superlative service.



Hoover F.H.P. Motors are available in drip-proof or totally enclosed frames. Split phase, capacitor start or three phase, with various mountings. Please write for the name of your nearest distributor.

HOOVER LIMITED

INDUSTRIAL PRODUCTS DEPT. · CAMBUSLANG · LANARKSHIRE · SCOTLAND

Editorial

RIDLEY REACTION

PERHAPS the first reaction to the Ridley Report will be one of relief—it might have been worse. Electricity's main platform "freedom of choice" has been held against all those cranks who aimed at foisting on the public their own particular brands of fuel planning. Secondly, the arguments in electricity's favour are all included, even though most are mentioned among the "other relevant technical factors" and may thus be lost to sight in subsequent over-simplified abstracts. Although the committee has been most exhaustive in their studies and has clearly aimed at complete impartiality, none the less, the "climate" of solid fuel advocacy in which the Report was produced is manifest throughout its approach to the problem of room heating. The reasoning is wholly based on the concept of continuous heating and beyond a brief mention of the efficiency of gas or electric fires for periods of "an hour or two," the fact that a substantial part of room heating in this country is of intermittent character is wholly ignored. This approach is one which has all the familiarity of the arguments of solid fuel advocacy.

SOLID FUEL COMPLEX

WITH the conflicting evidence submitted to the Committee by various bodies, it was probably a necessary step to set up a sub-committee to provide the assessment of relative efficiencies of heating appliances. Whether the composition of the committee was a wise one is another matter, since it consisted of experts from appropriate Government departments; B.C.U.R.A., the research organisation concerned with solid fuel; and Prof. F. E. Simon as an observer. The figures presented in the report are on the basis of appliance room efficiency for continuous burning and in consequence they have higher values than those normally given for the appliances themselves. It would seem, however, that these figures, accurate as they may be in themselves, are not applicable to continuous burning as defined in the report which covers periods as low as five hours. It is far more than five hours before the terminal factors of lighting a fire cease to have a substantial effect in reducing continuous burning efficiency figures. One feels tempted to wonder whether the technical sub-committee was aware of the definition of continuous burning to be adopted at the time they prepared their evidence.

TILTING AT TARIFFS

THAT half of the members of the committee who failed to secure the agreement of the others in making prices fit economic theory by raising the price of coal to its marginal value, was more successful in the case of electricity tariffs. Users of electricity at peak time must pay the full marginal cost; there must be no averaging, was the verdict. No doubt there may be a case for lowering the consumption level at which m.d. metering is adopted but the committee make clear their desire for price discrimination between peak and off-peak loads wherever possible. There follows in the report the familiar discussion of means of such domestic m.d. metering, the recognition of difficulties and the usual plea for more extensive trials. What is new, however, is the definite long term recommendation that for the larger domestic consumers, tariffs should distinguish between peak and off-peak loads. The possibility that this may constitute unfair discrimination and the statutory obligations on the B.E.A. to simplify tariffs are airily waved aside. Yet with all this discussion of the domestic consumer, the committee is quite clear that

it is the industrial and commercial loads that are mainly responsible for the peak. That there is more in the subject of tariffs than the committee imagines is indicated by their recommendation that the basis of the m.d. charge should be monthly and thus it would be as important to keep down the m.d. in summer as in winter. Perhaps that is why they suggest the problem should be passed to a new Tariffs Advisory Committee. In the general review of the report which is given on a later page there are other points of comment. No one can doubt the sincerity of the committee nor the thoroughness of their investigation, within the time that was available. There is much that is sound in the report, and much also that we hope will attain its proper position in a Whitehall pigeonhole.

SPEEDING SCIENCE

THIS year's British Association meeting did not satisfy itself with congratulations on a successful gathering when the recent week in Belfast came to an end. Plans were laid to ensure that in future years the Association's effect on the life of the nation shall be even more beneficial. In one direction especially these affect the electrical industry. This is the formation of a new committee—perhaps the forerunner of a new section—which is to consider the swifter application of research discoveries to industrial needs. Such a committee can do valuable work in making the Association's activities more directly helpful to engineers than they are at present. The gap between discovery and practical application is in many ways a measure of the time taken for highly specialised scientific ideas to be interpreted to and appreciated by the engineer. The guidance and interest of the proposed new committee could be a valuable aid in keeping this interval down to the minimum possible.

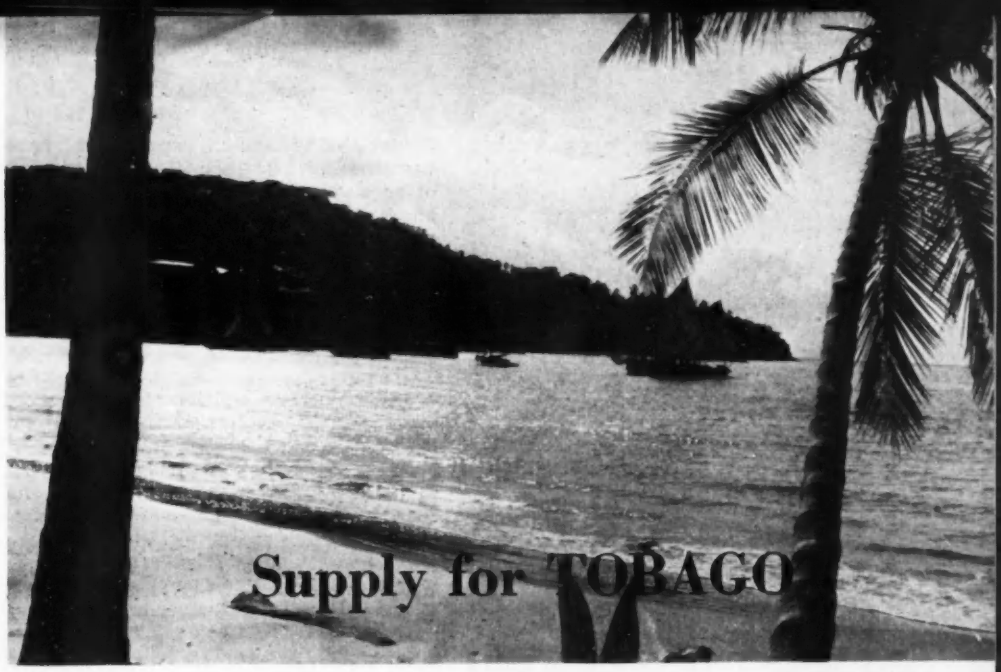
INVESTMENT IN SAFETY

SAFETY on the roads is so urgent a problem today that there can be little surprise that it occupies a prominent position in two papers presented to this year's Conference of the Association of Public Lighting Engineers. Special interest is added, however, by the varied experience of the authors concerned, for one speaks from a background of British practice, while the other brings news of the American approach to the same problem. Though the bases of comparison which they use are somewhat different, both are able to quote remarkable figures of reduced accident rates directly attributable to improved lighting of main traffic routes. More significantly, both have to admit that these improvements are relatively isolated incidents in a less happy story, and to criticise as over-small the investment which is being made in safety street lighting—especially in comparison with consumer spending on some of the more trivial luxuries of life. In the present difficult financial circumstances, calls for increased investment are common enough, but the case for better lighting as an important step in fitting roads more closely to their task does seem one of the most convincing.

SELLING BACKWARDS

MOST stories of high pressure selling come from across the Atlantic, and the latest we have heard comes from Canada. It would seem that offering equipment on approval is insufficient to counter the slump in sales, and one company is offering $10 to any customer who will try a refrigerator. It is installed free of charge and if at the end of ten days the customer does not want it, he receives a bonus of $10 for his trouble. How far removed such methods seem from those in this country! Here we have the burden of purchase tax for ever upon us, with our hands tied by restrictions on hire purchase. Before such methods could be adopted it would be necessary to obtain counsel's opinion as to whether the bonus contravened the hire purchase regulations and an auditor's advice as to whether the amount could be allocated to selling costs for the purpose of income tax. We are told that we, like the countries across the Atlantic, are actuated by freedom for democracy, but somehow the interpretations differ.

Meteor



Supply for TOBAGO

Wind power generation may eventually feed this British West Indies system

By K. W. FINCH

TOBAGO, an island about two-thirds the size of the Isle of Wight, is situated about 19 miles to the north-east of Trinidad. It is supposed to be the island on which Robinson Crusoe had his original adventures and has a history fraught with romance in the course of which, since 1656, it has many times alternated between British and French administration. The climate is salubrious, the scenery charming and the soil productive. At one time its sugar exports exceeded that of Trinidad. At present, however, the staple trades are coconut cultivation and a rapidly growing tourist industry.

New Power Plant

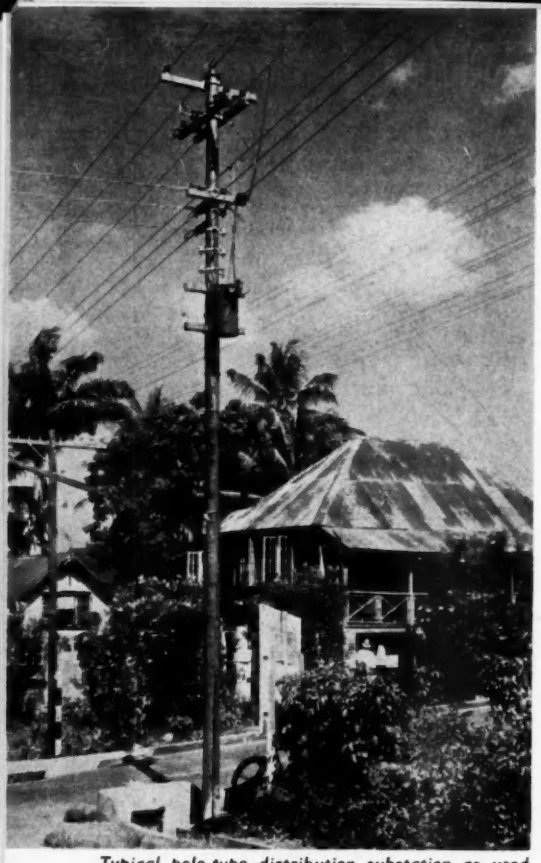
It seems surprising that an island of this size could have been so long without the benefits of a public electricity supply. The population, however, is scattered and the hotels and large estate houses have had their own lighting plants for many years. The Trinidad and Tobago Electricity Commission have now completed a project to provide a public supply of electricity in Scarborough, the principal town on the island, and its surroundings. To make the scheme pay it was essential that the capital costs should be kept to a minimum and the Commission were lucky to be able to acquire three second-hand diesel sets from Trinidad in excellent condition. The smallest is a 50 kW semi-portable diesel Caterpillar, the second is a vintage 110 kW slow speed Crossley, which had been laid up for many years in the small town of Arima in central Trinidad. The third set is a 165 kW Blackstone which, until recently, had provided the main supply for a brick works in the centre of Trinidad where a supply is now being given from the Commission's mains. A large piece of land just outside Scarborough has been purchased for the Power Station as it is inevitable that the demands for electricity, once the system is established, will grow rapidly. There is, therefore, adequate room to install two 2,000 kW sets with the necessary spray ponds when the load demands it.

The main power station building is of reinforced concrete, hollow clay bricks, and light slotted steel was used for the roof trusses. A local oil distributing company is establishing a bulk storage plant on an adjacent site which will enable the diesel fuel to be piped to the power station.

To prevent difficulties for retailers and consumers, electricity is supplied at the same volt-

---

Mr. Finch is General Manager of the Trinidad and Tobago Electricity Commission. The view at the top of the page shows the Harbour at Scarborough. Wind tests are being taken on the hill in the background. Photo Fritz Henle, courtesy of Trinidad and Tobago Tourist Board.



Typical pole-type distribution substation as used throughout the Island system

age and frequency as Trinidad, that is to say, 110 volts 2-wire or 220 volts 3-wire at 60 cycles. The main transmission is at 4,000 volts. Tubular steel poles are used for angle and terminal positions and wallaba wooden poles from British Guiana are used for intermediate poles. High and low voltage lines are run on the same pole line.

Hotels and Tourists

It is expected that the advent of public electricity will provide a fillip to the local hotel and tourist industry. The Trinidad Government has recently passed an Ordinance to give financial assistance to the hotel industry of the Colony generally and it is hoped before long at least one hotel in Tobago will be boasting of an electric kitchen. The streets of Scarborough will also soon be lighted for the first time, for which purpose it is intended to use 45 watt sodium lighting. There is a reasonable supply of labour available in and around Scarborough and it is possible that the advent of electricity will soon be followed by the founding of a number of small light industries.

The rates which the Commission is charging in Scarborough are inevitably higher than those applying in Trinidad as the scheme is essentially a very small one and it has had to be self-supporting from the start. In spite of this factor Tobago is enjoying all the advantages and economies of a small decentralised administration in the hands of a District Manager, at the same time getting the benefits of large-scale buying and general guidance from the Commission's Head Office staff.

As greater use is made of electricity in Scarborough and the surrounding districts and the system grows, the Commission hopes that prices can be reduced. Experiments are also being made of the possibility of harnessing the trade winds, which make the climate so delightful, to assist in the more economic production of electricity. It will, however, take at least a year of wind measurement to find out whether there is sufficient strength in these winds to make this commercially worthwhile.

The larger Trinidad system, to which reference is made in this article, supplies some 13,000 consumers, and operates a 12 kV transmission system. Both diesel and steam generation is employed.

Generators in the power house seen here under construction comprise three small diesel units, but there is room for two large 2MW sets

FUEL and the FUTURE

The Ridley Committee's Report is likely to lead to renewed controversy over heating

IN its terms of reference, the Ridley Committee on Fuel and Power policy was asked to advise on the measures possible to promote the best use of the country's fuel and power resources. Our short review of their report in last week's issue, summarised briefly their principal conclusions and recommendations: this present article makes an examination of the arguments by which the Committee reached those conclusions. Such a study is necessary to any evaluation of a document which is likely to affect the electricity industry for some time to come.

Domestic Heating

A start may well be made with the chapter of the report devoted to domestic uses of fuel and power. Room heating, water heating, and cooking are considered separately here, with the greatest attention being given naturally to the first. As in previous reports dealing with the domestic use of fuel, considerable discussion of efficiencies is involved, and a technical sub-committee was set up to examine the methods of arriving at suitable figures.

The definitions adopted gave a "thermal conversion index" as a basis for all comparisons, this figure being the product of the average transmission and production efficiency of the fuel involved, and the appliance room efficiency. The task of the heating appliance in every case is taken as the maintenance of the temperature of a room at a given temperature above the outside air. Allowance is made for any excess ventilation of the room caused by the appliance, and also for heat recovered from chimney breasts, etc.

There are two particularly controversial points arising from the comparisons presented on this basis. The first relates to the production efficiency of gas. The Committee here decided to reject the B.E.A.'s contention that the heat content of coal breeze and tar produced in the carbonisation process, and then used for non-thermal purposes (e.g. road making) should be debited against the process as a thermal loss. The second also works against electrical appliances. All results of efficiency calculations are presented in terms of continuous heating, which is defined as use for five hours or more. In the notes accompanying the figures, there is an explanation that at short heating periods, the end wastage of solid fuel appliances, such as unconsumed fuel, and inefficiency while burning up, will seriously reduce average efficiency for the burning time. This still leaves the impression, however, that at five hours these effects are negligible, a conclusion which readers of former articles in these pages will no doubt question.

In spite of these handicaps, however, the electric fire is shown to be comparable in efficiency with the gas fire and some types of open coal fire. The report then goes on to enumerate some advantages of the electric method of heating that cannot be readily appreciated from efficiency figures. These include the ease of control of electric appliances, the fact that the generating stations use types of coal in more plentiful supply than those required for other methods of house heating, and the constant efficiency of electric fires even in the face of deterioration in service, a characteristic not exhibited by gas. Finally come such points as the fact that the efficiency of electricity generation is known to be increasing the greater comfort heating advantages of radiation.

Water Heating and Cooking

For water heating, the report suggests that electricity is less efficient in terms of fuel than either solid fuel or gas. The basis on which the Committee reached this conclusion is not, however, very clearly stated. Many of the factors mentioned above as increasing the effective efficiency of electric fires apply again to water heating. A similar story applies to the comparison of cookers, where gas is accorded a slight and presumably temporary superiority in terms of efficiency, though the advantages of specialised electrical appliances such as toasters and kettles are clearly recognised.

RIDLEY COMMITTEE STATISTICS FOR CONTINUOUS ROOM HEATING

Type of Appliance	Present Average Production and Transmission Efficiency	Appliance Room Efficiency	Approximate Thermal Conversion Indices	Estimated Hourly Capital Cost (pence)	Estimated Hourly Total Cost (pence)
Electric fire	20%	100%	20%	0·16*	1·75
Gas fires: Radiant	48	45-55	20-25	0·72	2·36
Convector/radiant ...	48	55-65	25-30	0·65	2·02
Coke-fires:					
Closed stove	98	60-70	60-70	—	—
Openable stove	98	45-55	45-55	0·73	1·59
"Improved" open type ...	98	40-50	40-50	0·48	1·51
Coal fires:					
Openable stove	98	35-45	35-45	0.73	1·67
Improved open fire (best) ...	98	35-45	35-45	0·48	1·40
(worst)...	98	25-35	25-35	0·46	1·64
Old-fashioned grate	98	20-30	20-30	0·35	2·35
Central heating†	98	(70)†	(70)†	—	—

*Off peak. †Not applicable to room heating

Capital Costs

From this discussion of the coal efficiency of domestic fuel usage, the Committee passed to the capital costs involved. This introduced into their discussions the question of the peak load problem affecting electricity supply, that experienced by the gas industry being discounted as of little importance. At the end of a lengthy survey, which brings to light many points in favour of electrical methods of heating and cooking as against solid fuel and gas, the only conclusion that is drawn is that the use of electricity is expensive in capital resources at peak hours, but relatively inexpensive off-peak. The same conclusion, it is stated, does not apply to the capital costs of supplying gas or solid fuel. Combining considerations of running and capital costs, it is concluded that no single type of fuel installation is likely to give so cheap a pattern of domestic fuel application as is possible with a judicious mixture of, for example, solid fuel and electric.

Changes in the pattern at present existing should, it is suggested, be brought about not by legislative or administrative order, but by the effect of price levels working on the consumer's freedom of choice. For this reason, the idea of an upward adjustment of electricity tariffs as a means of relieving the plant shortage which the Committee believes exists, is rejected.

On the subject of purchase tax and its relation to domestic heating appliances, the recommendation is made that the present 100% rate on electric fires should continue. It is specifically stated that this is to apply for the "time being" only; this because of the contribution made to the peak problem. Fluorescent lamps, because of their efficient use of energy, are recommended for relief from the present 33⅓% imposition.

Three chapters of the report are concerned with the possibilities of closer co-operation between the fuel and power industries and the Government, and the discussion they present results in some important conclusions in relation to tariff policy. Freedom of choice is taken as the basis of all recommendations in this sphere, and for this to exist three desiderata are established. All prices and tariffs should correspond closely to the relevant costs of the particular services provided; the fuel industries should not impose on the consumer any conditions of supply which may restrict freedom of choice, unless they are justified by supply costs; and full information on fuel services and fuel efficiency should be made readily available to the public.

Tariff Adjustments

So far as tariffs in the electricity industry are concerned, the Committee recognises that any alteration is going to raise many complex problems. To translate all the relevant costs into a tariff for each consumer would be neither practicable nor economic. It is thought, however, that tariffs should always reflect plant capacity costs, and if this is to be the case, then they must differentiate between peak period use and other demands. Even industrial tariffs, which include a maximum demand component, do not meet the Committee's requirements, because there is no allowance for the time at which the maximum demand is made with reference to peak hours. Methods which would permit the introduction of such a factor are available, but they are all expensive and in most cases technically complicated. Nevertheless, the Committee calls for extensive practical trials in order to determine which is the most suitable. There is also a feeling that since the objective should be to encourage consumers to use current at off-

peak hours by the extended use of maximum demand meters and of special night rates for commercial and industrial consumers.

So far as domestic consumers are concerned, it is recognised that the installation of peak load limiting or metering devices would not be worth while for the great majority of domestic consumers who "individually, when the diversity of timing between their various demands is taken into account, have a small peak-hour load." Yet since half the domestic electricity taken by all consumers is used by one-eighth of their number, it is suggested that the long term policy in regard to domestic tariffs should be to discriminate between on- and off-peak uses, for the larger consumers at least.

Private Generation

The general policy proposed for tariffs should serve, too, for the purchase by electricity boards of energy from private generating plants. The prices paid should reflect the board's saving in expenditure as a result of purchasing the current. The charge for power supply to such firms would consist of a rental charge for the administrative and distribution costs incurred by the board, an effective insurance premium against the firms requiring power from the board (to cover capacity costs) and a charge for units taken.

This same principle of making prices correspond with costs is also suggested for application in regard to conditions under which gas and electricity boards connect consumers. In particular, it is suggested that the restrictions on the period for which private plant may be run, imposed in some electricity agreements, should be publicly and permanently abandoned.

In the matter of connection charges where new consumers are to be supplied, the situation is recognised as being more complex. The practice by which connection charges are reduced in cases where, because of the absence of facilities for using some other form of energy, relatively high consumptions may be expected, is singled out for special criticism. The argument is, that it interferes with true freedom of choice. The right practice is presented as the inclusion of the annual charge due to connection costs in typical cases in the first block of a variable block tariff or the fixed charge of a two-part agreement. When costs are substantially in excess of this, they should be charged to the house owner directly without relation to prospective consumption.

The final requirement in the list for ensuring freedom of choice is the provision of information. How this is to be arranged is difficult to determine. The Committee rejects the idea that showrooms of competing fuel industries should be amalgamated, as there is no desire to "curb the competitive zeal of those who sell the various fuels." They reach the conclusion that the Ministry of Fuel and Power should establish a suitable centre in every large town. Effectively this proposal repeats one made in the 1946 Simon Committee report.

Supervised Competition

Complaints that competition between gas and electricity has sometimes been carried to uneconomic lengths are held to have some substance, and the Committee sees the need for a framework in which competition can be contained within reasonable bounds. It is felt that although it is not desired to impair in any material manner the high degree of managerial autonomy at present enjoyed by the boards, they should not be left with sole power to determine price structures. Consequently, the setting up of a small Tariffs Advisory Committee is recommended, its composition to be five to seven independent members of suitable experience. They would report to the Minister in response to his request for advice, or on their own responsibility, and they would invariably be consulted before major changes in tariff policies were approved. They would also consider conflicts between the accepted policy on pricing and the practice of individual boards.

As stated last week, there is one other board whose formation the Committee advocates. This is a high level Joint Fuel and Power Planning Board composed of representatives of the nationalised fuel boards. It would be assisted by a technical staff coming directly under its control, and capable of investigating fuel and power projects under consideration by the Board.

There was disagreement between the members of the Committee when the subject of coal prices came to be considered. On grounds of economic theory four of them wished to see the price of coal raised by about £1 per ton. This would make the price representative of the "marginal" cost of production—the cost of mining the most expensive coal from the production viewpoint. The extra charge would be applied to the N.C.B. in the form of a royalty payable to the State, imposed on the scarcity value of the mines where coal was relatively cheap to produce. While the other members of the Committee recognised the validity of those theoretical considerations underlying this suggestion, they did not agree that it would result

in more coal being produced or used. In their opinion the overriding principle is that coal is so important to the national economy that it should be sold at the lowest price which is consistent with the N.C.B. covering its costs.

Industrial Fuel

In a short chapter dealing with the non-domestic use of fuel and power, the report places faith in improved advisory services as a means of improving efficiency. The often-canvassed idea of industrial rationing to individual firms, based on the efficiency of utilisation they achieve, was rejected as too complicated to be administratively practicable. With this view Sir Claude Gibb did not concur.

Because resources for capital investment are limited, the Committee recognises that industrialists tend to use what funds are available to increase production rather than improve the efficiency of fuel use. For this reason the Committee advocates the granting of special Government loans at an attractively low rate of interest as a means of encouraging plant improvements.

Double shift working as a means of improving electricity load factors and so saving coal that must otherwise be burnt in the less efficient generating stations at peak hours, is another recommendation put forward, while there is a feeling that special steps should be taken to assure fuel supplies to firms mainly engaged in the manufacture of special items of fuel-saving equipment.

So far as the B.E.A. is concerned, it is recognised that despite its attraction as a fuel saver, the wide adoption of district heating in this country for domestic purposes is not economic. This is because of the increase it occasions in the cost of power station plant for a given electricity output, the very high costs of connection to houses.

Plant Stimulation by Light

AS might be expected in these days when the application of electrical methods to horticulture is increasing rapidly, there was considerable emphasis on electricity at the International Horticultural Congress which closed on Monday. Prominent among the speakers on electrical subjects were Mr. C. A. Cameron Brown, agricultural electrification adviser with the B.E.A.; Mr. E. W. Golding, head of rural electrification and wind-power generation department of E.R.A.; and Dr. H. A. Borthwick and Dr. M. W. Parker, principal physiologists at the U.S.D.A.

The title of Mr. Brown's paper was "The Application of Electricity to Commercial Growing," under which he dealt methodically and at some length with soil-warming, its application and installation, space heating, soil sterilisation and light irradiation. He said that the main expansion in horticultural electrification equipment had been in the use of soil-warming apparatus which had developed on the I.v. principle. Space heating by electricity had not been encouraged although it had been adopted for many smaller houses, mainly for propagation purposes. Soil sterilising was carried out on the electrode principle and by immersion heaters, he said, but light irradiation was only now being applied commercially for raising tomato seedlings.

Electrical methods of raising soil temperature were discussed under similar headings by Mr. Golding in his paper entitled "The Use of Electricity to Increase Soil Temperature." Emphasis was laid on the energy consumption for specified temperature rises and on temperature distribution. The speaker also described briefly E.R.A. researches in soil warming and soil sterilisation and some of the results.

American Contribution

The American contribution comprised a paper on "Light in Relation to Flowering and Vegetative Development," by Dr. H. A. Borthwick and Dr. M. W. Parker. This paper discussed practical problems in the regulation of flowering by use of supplemental artificial light. It was divided broadly into two parts. The first dealt with the relative merits of radiation from fluorescent and incandescent-filament lamps, and the second with the effectiveness of dark-period interruption for control of flowering and certain vegetative expressions of strawberry.

Another paper of interest to the electrical industry was that by Dr. J. W. M. Roodenburg, plant physiologist research worker with the Netherlands Ministry of Agriculture, entitled "Irradiation of Greenhouse Plants by Artificial Light Sources." An address directed to commercial growers not content with their production costs and yields was given by Mr. J. W. C. Lawrence of the John Innes Institution. He commented on the fact that the illumination of tomato and cucumber seedlings with mercury or fluorescent light gave surprising increases in yield, adding that such installations were, in his opinion, one of the best investments.

Notes on Wiring by MEGOHM

ELECTRICAL ACCIDENTS

Ways of Reducing Their Numbers

IT is distressing to read in the Press, from time to time reports on electrical accidents and I quote two cases reported on August 25 and 27. Firstly a Mr. R. Henderson was electrocuted when the electric light lead he was holding shortcircuited whilst he was renewing a wooden beam at his home; secondly a Mr. A. M. Jackson was electrocuted when fixing a television aerial in the loft of his house because the light lead he was holding was equipped with a switch designed for use on a 12V circuit. In the latter case the coroner stated: "He appeared to have some sort of electrical knowledge but unfortunately this sort of thing happens to a lot of amateur electricians."

Fewer Accidents

In respect to "this sort of thing happening to a lot of amateur electricians" the problem is to find a way to prevent a number of such accidents, if we cannot completely eradicate them. Engineers engaged in the electrical contracting industry have over a number of years advocated: (1) Work to be carried out by craftsmen under skilled supervision. (2) A national clearing house for electrical equipment. (3) Installations to be inspected and tested at periodical intervals preferably at least once in every 12 months. (4) A publicity drive on the lines of the road safety campaign drawing attention to shoddy workmanship and misuse. (5) Statutory Regulations. (6) Compulsory registration of contractors and operatives. (7) The reduction of mains voltage to a safe potential.

By adopting one or more of the above proposals the use of electrical equipment in the home can be more safe and the accident rate substantially reduced. To my knowledge objections have not to date been raised to Items 1, 2 and 4. For Item 3 objectors maintain that the cost for inspection and testing installations would be prohibitive. For Items 5 and 6 the I.E.E. to date have not withdrawn their considered statement published in 1941, that there was not sufficient evidence to justify a statutory scheme of registration of contractors and operatives or for compulsory wiring regulations.

The E.C.A. and the A.S.E.E. and many members of the E.T.U. who are the people directly concerned with installation and maintenance work have strenuously pressed for statutory wiring regulations and compulsory registration. Mr. L. C. Penwill, Director and Secretary of the E.C.A., presented a very strong case in 1944 for the adoption of such a system. Further, a scheme for examining, licensing and registering contractors, operatives and others engaged in electrical installation work has been produced on the lines of schemes now in force in the Dominions. Objections follow on the lines of "you cannot prevent people doing what they like in their own homes" and compulsory inspection and testing of installations would be resented on the grounds of interference with the privacy of home life. A well-known consulting engineer, some time ago said in his view more people were killed as a result of wearing shoddy foot-wear and in his considered opinion Statutory regulations and compulsory registration was unnecessary, although he was in full accord with the aims of the National Register which is a voluntary organisation that periodically inspects the work carried out by its members.

Portable Tools

The reduction of mains voltage to a safe potential is now adopted by the B.E.A. for supplies to portable hand tools and lamps. The operating voltage for hand tools is 110 V and the potential to earth is 55 V. Whilst I would not venture to suggest 55 V is completely safe, it is reasonable to assume that most people can stand it and release themselves before they are gripped by muscular contraction.

The adoption of 110 V services for residential and office premises which is standard practice on the Continent and in the United States, is the safe approach and if adopted would not only reduce the risk of lethal shock but assist our export trade, which demands 110 V equipment.

In the meantime the advantage of introducing statutory regulations and compulsory registration should be given further consideration by the appropriate authority.

The President: E. HOWARD Esq., F.I.E.S.
City Lighting Engineer, Nottingham

A.P.L.E. 1952

Lighting and Safety

HARROGATE'S Royal Hall provided a dignified background to the opening ceremonies of the conference of the Association of Public Lighting Engineers. On Tuesday morning some 1,100 delegates and visitors, including some from Europe and the Americas, assembled for the Association's annual general meeting followed by the induction of the coming year's president, E. Howard, F.I.E.S. (Lighting Engineer, City of Nottingham). The official opening of both conference and exhibition was performed by the Mayor of Harrogate, Councillor A. V. Milton, J.P., who afterwards, accompanied by Mr. Howard, inspected the exhibition and outdoor display held adjacent to the Conference Hall.

President's Address

First event of the afternoon was the presidential address, in which Mr. Howard surveyed some of the topics of current interest. His initial theme tended to the introspective, dealing with internal matters of the Association, particularly the scheme, approved last year by the council, for the award of a diploma as an indication of a professional standard in public lighting engineering. After reviewing the history of this project he went on to point out that the recommended examination syllabus showed consideration of the practical aspects of the subject and that educational requirements and experience had been chosen bearing in mind the varying training and background of Association members. He also spoke of the setting up of provincial sections of the Association.

Turning to more general topics the president referred to "this scourge of our national life"—road accidents and their relation to street lighting. In pointing out that the alarmingly high figure of accidents after dark indicated clearly that adoption of the standard laid down in the Code of Practice for Traffic Routes would make a valuable contribution to greater safety, he went on to review outstanding facts.

It was generally agreed, he continued, that headlight dazzle was the chief offender. The recommended standard in C.P.1004: part 1: 1952, provided an ample margin of safety without headlights, shown by an interesting experiment made in Nottingham where lighting in a particular section had been improved to this standard. Observers noted that only 6% of drivers along this stretch of road used headlights and only 9% dipped headlights.

From a statistical aspect, nothing definite in this country is available to relate lighting to

Good lighting is a prime factor in cutting down the daily toll of human lives. This sodium lighting at Wokingham is by Philips

accident figures, but he felt existing methods of recording street accidents could be easily modified to obtain this observation. From both Canada and U.S.A., figures are available which show a considerable reduction in accidents consequent upon improved street lighting. Investigations should be held in this country to determine the effect of improving lighting to the recommended standard. Preferably a smaller town, having a bad accident record, could be used. Was it unreasonable to suppose that money could be found for this purpose from the same source as that conducting the present "zebra" crossing experiment?

His final salvo on this subject was a comparison of costs. Annually, lighting costs some 6s. 1d. per head of population, or about £12 million, and the only financial assistance to local authorities was for the lighting of trunk roads. Estimating the annual cost of providing lighting to the appropriate standard on all classified roads at £8 m., he suggested that this sum was but a small insurance premium to save £146 m., the estimated cost of last year's road accidents. And unless local authorities received some assistance, "then I see no alternative as far as street lighting is concerned but for this scourge on our national life to continue."

Remaining points in his address included a brief outline of Nottingham lighting and a welcoming of the recent innovation of the Ministry of Transport in appointing Divisional lighting engineers, concluding with a wish for a section devoted to the art and practice of street lighting in the National Science Museum.

Control of street lighting

by N. AXFORD, B.Sc.
District Manager, South Western Electricity Board, Plymouth

UPON the conclusion of the president's address, the first technical paper was presented. In his paper "Methods of Controlling Street Lighting," Mr. N. Axford, B.Sc. (district manager, South Western Electricity Board, Plymouth), set out to survey existing systems on an efficiency comparison basis, dealing in the main with urban districts.

The first and most expensive control method is by using the now rapidly disappearing lamplighters. Apart from the cost, of the order of £2 10s. 9d. per lamp per annum, this method has the added disadvantage that lamps in any one district are switched on or off at widely different times.

Time switches which control most modern street lighting, when hand wound, proved to be almost as expensive as lamplighters, the cost varying between £2 5s. and £2 2s. 6d.; moreover as clockwork mechanisms are incorporated they may suffer if used in polluted atmospheres. The synchronous motor switch with a solar dial is much cheaper—10s. 2d. per annum, but unfortunately it is sensitive to supply changes. Consequently excessive load shedding necessitated resetting all switches, involving considerable time expenditure. On the other hand, the electrically wound clock-driven switch, which often includes a spring reserve is not so affected. As these are somewhat delicate instruments, their cost is somewhat more, approximately 18s. 6d. per lamp per annum.

Connecting group control systems with five-core cable or separate switch wires the cost is estimated at about 7s. 3d. per annum. These systems have the disadvantage that switch failure will affect the whole group, while the use of half and all-night lighting is impossible.

A limiting factor in the foregoing fifth wire systems is the current capacity of the extra conductor. By using cascade control this limitation is avoided. In this method, one switch operates a group of lamps taking current within the capacity of the conductor and in addition a relay which switches on a second group. A relay in the second group operates a third group in turn. The use of this system is less popular since, should a relay fail, all successive lamps are automatically inoperative. The cost of this system is that for normal fifth wire control plus the cost of relays.

Time switches in any of the previous systems may be replaced by light-sensitive cells, but this method offers problems in the satisfactory siting of cells and ensuring that the receptive surface is kept clean. Its cost is approximately

the same as that for fifth wire control.

The last method reviewed by the speaker was that of centralised control by signal currents superimposed on the distribution network. Normally the signals are required to switch on all lights at dusk, to switch off part of the number at an early hour and the remainder at dawn. A.c. or d.c. may be used, but whatever system is adopted there should be no limitation imposed on the operation or extension of the distribution network nor must the equipment in use involve modification of power plant or switch gear. This system is expensive, due to the high cost of the signal generating and injecting equipment, but it is gaining in popularity and it was hoped that area boards would before long be able to offer this control system to all lighting authorities in their areas.

Illumination as an Art

by H. CARPENTER, M.I.E.E.
Illuminations and Public Street Lighting Officer, Blackpool

THE following morning, delegates considered the artistic, as opposed to the utilitarian, aspect of public lighting in the paper "Illuminations and Outdoor Decorative Lighting," by H. Carpenter, M.I.E.E. Commenting on the psychological reaction to light, the speaker discussed applications of the art, from floodlighting to the more elaborate "Illuminations" of some sea-side resorts.

Equipment used for these purposes tended to be expensive in view of its limited application. In addition, it has to withstand all types of weather including the salt spray likely to cause trouble in sea-side lighting. Moreover, quality should not be sacrificed for cheapness, nor must workmanship be of a poor standard.

Festoon strip was subjected to these conditions and its mounting should be on the catenary system for added strength. Lamps should be chosen for their luminous efficiency and correct colouring and as the number of lamps was the main criterion, low wattage types were preferable.

Easy maintenance and weather protection have to be considered when installing the electrical circuit. Leakage also cannot be ignored, for if wooden structures are used leakage may endanger the safe handling of pieces and arcing to earth can cause repeated breakdowns if metal scaffolding is used. Sequence control equipment of the drum type is another problem for maintenance, but experiments are in hand on a telephone relay timing device operated by impulses.

For parks and gardens, floodlighting or mushroom type units can be effective, but colour should be used with care. Water is an ideal focal point, especially in movement, and the maximum effect can be gained from reflections. For buildings, the cheapest and best way is by floodlighting.

Planning any particular scheme involves a study of all relevant issues, from financial resources to legal complications in using roadways, gardens or promenades. Enlisting the services of a lighting engineer experienced in decorative lighting is advisable, as the final scheme will depend as much upon experience as upon artistic interpretation.

Electricity supply arrangements with the

This huge set piece, part of this year's Illuminations at Blackpool, is a tribute to H.M. Queen Elizabeth II

local board depend upon the size of scheme, and for small schemes a low voltage supply at several feeding points can usually be provided. Special terms should be decided. For larger schemes it may be possible to obtain l.v. supplies at standard rates or at h.v. points at special tariffs.

Easy maintenance during operation and public safety should be two other principles of installation and suitably skilled staff are necessary, to be available at all times the lighting is operating.

Of the cost of such schemes, it is difficult to lay down any figure, but expenditure by various holiday resorts on their lighting schemes is given in the paper, with figures to indicate their size. Also discussed were the costs of the main items of equipment, from festoon strip to large tableaux.

It is expected that with the introduction of new media this artistic science should flourish. Restrictions on the use of electricity for this purpose would, it was hoped, disappear, although the real fuel saving in this respect is questionable.

American Street Lighting

by Dr. A. F. DICKERSON
General Manager, Lighting and Rectifier Department, G.E.Co. of U.S.A.

PUBLIC road safety formed the introductory theme to Wednesday afternoon's paper, "Street Lighting—U.S.A." by Dr. A. F. Dickerson, general manager, lighting and rectifier department, General Electric Co., U.S.A. On December 22 last year, the millionth American traffic fatality occurred just 51 years after the first. During that year 37,500 people were killed, 1,300,000 injured, involving an economic loss of $3,500,000,000.

Steps have been taken to cut down this number, with beneficial results in the daytime. At night, steadily increasing traffic and poor visibility have combined to maintain the rising figure, so that the average for the country is now about two night deaths for one daytime fatality, with the ratio rising to four to one in poorly lighted towns. Various means have been used to awaken the general public to the need for better street lighting and data collected have proved how dependent on lighting is death's toll.

Detroit, as an example of this dependancy, embarked on a programme of modernisation. For 15 months before the scheme was started, the ratio of night and day fatalities was 7·3 to 1. In 18 months, after 31 miles were relighted, this figure fell to 1·4 to 1. Other towns provide similar examples and in many cases only local installations of improved lighting at danger spots proved sufficient.

Over 100 cities now spend more than $2 per head on lighting, but at least $2·50 to $4 is required for lighting meeting American Standard Practice. New investments for improved lighting vary from New York's $20,000,000 to $5,000,000 for Kansas City. Moreover, adequate lighting is estimated to reduce the yearly death figure by 5,000 to 10,000 and save about $500,000,000 for an outlay of about half that amount. Kansas City, with a population of 400,000, as a representative example of what can be done, undertook, in 1944, to improve its lighting. Increasing the cost from $552,000 to $626,000, the new lighting provided over four times more light output for fewer lamps and resulted in a reduction in the night/day ratio from 9 to 1 to 1·2 to 1 in 1951. Another effect was to cut down petty thieving in the relighted districts.

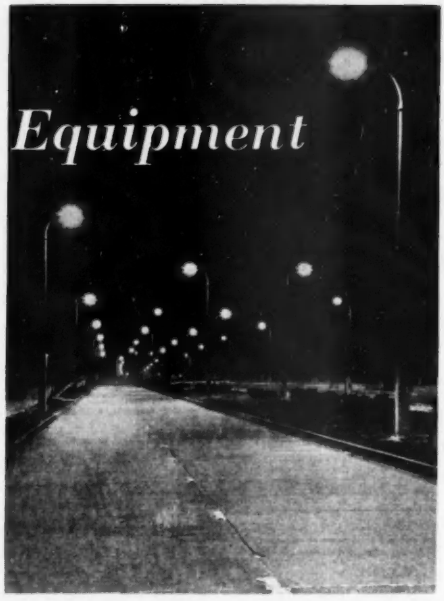
Standards for street lighting are first prepared as a suggested practice, by the street lighting committee of the Illuminating Engineering Society and then issued by American Standards Association as American Standard Practice. Various diagrams showing the type of lighting now recommended were presented and it was pointed out that all major manufacturers produce lanterns which satisfy these requirements.

Lanterns at present in use include 4,000,000 fitted with tungsten filament lamps and 60,000 mercury lamps which are rapidly increasing in use. Most of the installations are 15,000 lumens but 20,000 lumen types are currently popular and will eventually outnumber all others. Sodium lamps number about 15,000 and as these lamps are used only at danger zones, this figure will probably not increase. Little fluorescent lighting is at present employed but British experience with this type of lighting is being watched with interest. Experimental installations, using a 96 in. 0·6 amp lamp, successful as street lighting, have been criticised because of length and expense of lanterns, but it is hoped the newer 72 in. 1 amp lamp will prove more popular.

A.P.L.E. Conference

Public Lighting Equipment

Engineers see latest types of lanterns and auxiliary gear for street lighting, traffic control, municipal and decorative flood lighting



Good example of efficient street lighting is this installation of Siemens "Sola-Sieray" single plate refractor lanterns mounted on Concrete Utilities' columns in Church Road, Liverpool

THIS year, the exhibition of modern street lighting apparatus and equipment, at the A.P.L.E. Conference, at Harrogate, makes a welcome return after last year's absence. An ever-popular feature, it is housed in a marquee adjoining the Royal Hall, where the conference is meeting, and the outdoor exhibition associated with it is being held in grounds at the rear. Many new items are being shown, some making their first public appearance, and as a guide to what may be seen we list below, in alphabetical order, those manufacturers who are displaying equipment.

Automatic Telephone and Electric Co. Ltd.

Featured on this company's stand is their "Type 46" control switch, developed for use with their "Rythmatic" ripple control system for centralised remote switching of street lighting. To facilitate converting existing installations to ripple control, this switch has been specially made to fit into the same space as that of an ordinary time switch.

Brit. For. & Col. Aut. Light Contr. Co. Ltd.

This stand exhibits a full range of the company's "Gunfire" time switches. Among these is to be seen their model EW/10, electrically wound with four days spring reserve. Also on show is their GF/3, a similar type but with only 24 hours reserve.

British Thomson-Houston Co. Ltd.

New exhibits are the centre of attraction at the "Mazda" stand this year, exemplified in the company's new fluorescent lantern for Group 'A' lighting, two sodium lanterns and mercury vapour lanterns. The fluorescent lantern is available for two or three 80 W 5 ft tubes and can be supplied with either switch start or "Instant Start," auxiliary equipment. Other features are clear "Perspex" cover bowl and a polished anodised-aluminium reflector. In models of sodium lamps, two types are available, open or enclosed, of which the former shows a departure from previous models, incorporating built-in "Perspex" refractor sides and a flexible moisture-proof rubber lampholder. Enclosed sodium lamps feature side panels and anodised-aluminium reflectors as a complete optical unit, completely enclosed in a clear "Perspex" cover. Both types may be supplied for either top or side entry mounting. Anticipating next year's Coronation festivities, other exhibits in this stand include Mazda floodlights, complete with a range of coloured lamps.

Costain Concrete Co. Ltd.

Prestressed and precast concrete columns being shown in this outdoor display include three Group 'A' lighting columns, 25 ft high with outreaches of 2 ft 6 in, 4 ft, and 6 ft. All are made in prestressed concrete, in which the concrete is in compression at normal handling or working loads. When subjected to bending stresses, in excess of working conditions, no point nominally subject to bending is in a state of tension. Other columns for Group 'B' lighting include their "C" bracket model.

Crompton Parkinson Ltd.

This company, showing in both the exhibition and outdoor display, have on view their "Aries" type, a prismatic glass drum refractor lantern employing 85 or 140 W sodium lamps, in which the drum may be rotated to orientate light beams in relation to the road surface to reduce glare on gradients. A full range of other lanterns is being shown for sodium or tungsten filament lamps. Interest is, however, centred on the Crompton "Concept" described as a revolutionary development in street lighting equipment, which is being shown for the first time at their temporary headquarters at the Cairn Hydro Hotel. In conjunction with Concrete Utilities, Ltd., the company have produced this fitting from the conception of lantern and column as one architectural unit. In both types available, the bowl assembly is attached to a concrete head developed from the bracket. Only a narrow ring of metal is thus exposed, which if constructed from high corrosion resistant material, does not require painting and reduces maintenance to a minimum. For side road lighting, "Concept I," supplied with "Estate Minor" column, can be used with 100/200 W tungsten or 80/125 W mercury lamps. Light control is effected with a prismatic glass bowl. "Concept II," for main road lighting, for 85 or 140 W sodium lamp, comprises a self-cleaning open "Perspex" bowl, with prismatic plates of the same material sealed to the inside for light control.

Electrical Development Association

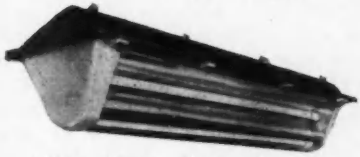
Safety, beauty and efficiency form the tripartite motif on E.D.A.'s stand. Although in the nature of an information bureau and rendezvous, their stand features improved road safety illustrated by diagrams of various types of lighting taken from the British Standard Code of Practice (No. 104, Part 1, 1952). In addition a photographic display is used to illustrate the use of electric lighting to enhance local amenities and the remaining part of the trio indicates graphically how increased use of electricity for street lighting has resulted in a more efficient use of coal.

Crompton's latest, "The Concept"

Above is Stanton's 8F or 8D column

On left, Holophane's post top lantern has 2-way non-axial light distribution. Above: G.E.C.'s Z9720 is for lighting side roads

This Revo wall-mounting lantern is for two fluorescent lamps

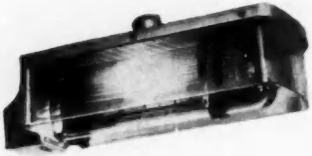


B.T.H. Mazda fitting for three fluorescent lamps

Metrovick M.V. 'Trafford II' for m.v. lamps and Eleco's 'Welwyn'

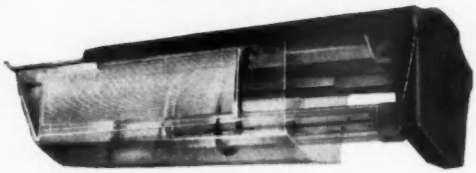
Edison Swan Electric Co. Ltd.

For Group 'A' or 'B' applications the "Ediswan" totally enclosed SSA/1 is being shown. Accommodating a horizontal sodium lamp, this lantern incorporates a sliding "Perspex" enclosure with sealed refractor plates. In addition to samples of other lanterns, their open type (BT 20) for Group 'B'



Falk's Fulmar lantern for sodium vapour is designed for Group 'A' roads

The Ediswan lantern type SSA/1 shown below has its Perspex cover removed for easy servicing



lighting and suitable for housing estates or works yards, is also on view.

Engineering and Lighting Equip. Co. Ltd.

Several new lanterns are displayed on this stand including models for 45/60 W sodium lamps and 100 W tungsten filament lamps. Also on view is a new styled version of their "Welwyn" fitting, in which improvements made include re-styling external appearance and concealing refractor retaining springs within the body casting. In this way interior congestion has been reduced and in addition the springs are now protected from atmospheric conditions. Similar modifications have been made to the "Ware," "Baldock," and "Letchworth" lanterns.

Falk, Stadelmann and Co. Ltd.

A new model of their "Fulmar" lantern has now increased this range to three lanterns. The new model has provision for top entry and is designed for use with standard steel or concrete columns. Provision is made to divert moisture from entering through the bracket. The three "Fulmar" lanterns now available are two for Group 'A' roads using 85/140 W lamps, one with side entry and the other top entry, and the third for 45/60 W lamps for Group 'B' roads.

Ford Motor Co. Ltd.

One of Ford's exhibits in their outdoor display is a 25 ft three-stage tower wagon mounted on a "Thames" chassis. The tower, manufactured by the Eagle Engineering Co., Ltd., is constructed of braced ash and oak framing, fitted with steel wearing plates. To assist stability the tower is mounted directly over the back axle, on a revolving platform, operating through 360°, and a safety device is fitted to prevent the tower descending accidentally.

General Electric Co. Ltd.

Increased use of "Perspex" and die-cast alloys, is to be noticed in lanterns exhibited on the G.E.C. stand. Emphasis is also placed on side road lighting, and among lanterns for this use are a vertical post-top lantern Z.5630, making its first appearance. Also being shown is the Z.8441 vertical post-top fitting, using four 2 ft fluorescent, with its horizontal counterpart Z.8243/4 for two lamps. Other lanterns representative of the company's products are displayed, for both Group 'A' and Group 'B' lighting, among which is a wall-mounting for fluorescent tubes, a new design arousing much interest.

Gowshall Ltd.

Exhibiting both in the indoor and outdoor displays, this company have a variety of illuminated road fittings. In their range of guard posts is the "50," in which no component part is allowed to protrude. "Sheerline" in character, this post uses two 25 W b.c. pearl lamps, and panels in the back give easy access to switchgear. Their "Signlite" units, also on show, have been designed to give uniform illumination to many sizes of road signs.

Holophane Ltd.

Among exhibits on this company's stand are to be seen a modified sodium cylindrical refractor lantern, in which a smooth finish and internally protected prisms have been provided to facilitate maintenance and to control light output. Rotation of the cylinder enables the angle of incidence of light on road surfaces to be adjusted. Two new designs of post-top lanterns are also displayed, both for use with either tungsten filament or sodium lamp, providing two-way non-axial light distribution.

The Horstmann Gear Co. Ltd.

A comprehensive range of Horstmann electric time switches, developed to meet the many requirements of modern lighting control, are on show at this company's stand in the indoor exhibition. The range covers hand-wound models from 15- to 40-day run, synchronous motor-driven models with or without spring reserve as required, and electrically wound models, among which is one claimed to be the smallest and most compact switch of this type.

John Kerr and Co. (Manchester) Ltd.

Included in this company's display of aluminium alloy tower ladders is a triple-extension model mounted on a two-wheel trailer. Also on view are 18 ft double tower ladders and an extensive range of commercial ladders, suitable for street lighting work, although special designs to customers' requirements can be supplied.

R. A. Lister and Co. Ltd.

This company's outdoor display includes the Lister "Eclipse" portable telescopic tower ladder mounted on their "Auto Truck." In four sections, the tower ladder framework is made from Western Canadian timber and English ash, fitted with steel tie-bolts and elliptical strainers to maintain rigidity. Sections are raised by a power-operated lift, the steel cables used having a mean breaking strain of 1·6 tons.

This 25 ft. three stage tower by Eagle Engineering is mounted on a Fordson "Thames" chassis

Gowshall's have produced this illuminated beacon globe assembly

Poles Ltd.

An attractive finish to this company's "Adastra" galvanised sectional steel columns is provided by bronze spraying, an alternative to painting, and columns with this finish and oxydised bronze variations are to be seen on their stand in the outdoor display. Both circular and hexagonal types are being shown for Group 'A' and Group 'B' lighting. "Adastra" floodlight columns are represented by a model also on view, and these can be supplied up to 70 ft in height. They are of tapering sectional steel design, so that for storage or transport sections can be packed inside each other.

Revo Electric Co. Ltd.

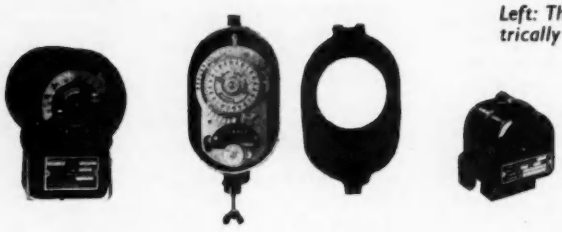
In both the indoor exhibition and outdoor display the company are showing a comprehensive range of street lighting equipment. Fittings to be seen include the "Festival" vertical fluorescent unit housing four 5 ft tubes in a dome with a base of cast aluminium. Lanterns for use with mercury or sodium lamps are also on view, among which is a new sodium type, C13720/3 for 45/100 W lamps, comprising cast aluminium alloy canopy with an internal reflector and a single-piece moulded "Perspex" bowl. Columns shown in their exterior display include the "Vanguard" in tubular steel.

The Rheostatic Co. Ltd.

Single, double and triple pole "Satchwell" contactors are being featured on the Rheostatic Co.'s stand. Robust in construction and silent in operation, they are claimed to give satisfactory and efficient performance for long periods. They can be supplied in die-cast aluminium or sheet steel cases to suit customers' requirements.

Siemens Electric Lamps and Supplies Ltd.

In view of the impending Coronation, floodlighting and decorative fittings form a part of this company's stand. The range on view covers all applications from long-range projec-



Left: The Horstmann type "V" electrically wound time switch has a solar dial

In the centre is Venner's latest TJSSP time switch with its cover removed, and next is the Rhythmatic Type 46 control switch by ATM

tion to wide angle lighting. Street lighting equipment being shown includes a recently developed fluorescent post-top fitting for 2 ft "Sieray" tubes and the "Wilton-Sieray" 3480 lantern for Group 'A' lighting. Another exhibit is their DEV/038 "Sieray" sodium lantern, embodying drum prismatic glassware and a sealed optical system.

Springbank Quarry Co. Ltd.

Their outdoor exhibition shows four types of their concrete columns, of which two are 25 ft mounting height. In a polished red granite finish type "C" having 4 ft 6 in outreach is being shown and type "H" with a narrow base and 3 ft 6 in bracket is finished in polished grey granite. Two 15 ft mounting height columns displayed are their types "A.E.1" and "F", both finished in smooth grey granite of which the former is fitted with a post-top lantern.

Stanton Ironworks Co. Ltd.

Of this company's eight spun concrete columns being displayed, four are new designs of 25 ft columns and brackets, approved by the Council of Industrial Design. Other columns in their No. "7" series, 25 ft mounting height, are also being shown. Photographs and scale models are on view on the company's stand in the indoor exhibition.

Stewarts and Lloyds Ltd.

A selection of their standard tubular steel columns is being shown by Stewart and Lloyds, Ltd., at the outdoor display. Of these eight are for Group 'A' lighting and four for Group 'B'. and they are either plain circular or fluted steel types, meeting the requirements of B.S.1840/1952. It is noted that no ornamentation is incorporated in any of the columns on view, although these can be supplied to individual requirements.

Thorn Electrical Industries Ltd.

The keynote of this company's display is "Coronation Year Floodlighting," well supported by an ample range of fluorescent and tungsten filament floodlights. Additional features are a display of colour changing floodlighting associated with waterfalls or fountains and ultra-violet fluorescence. Photographs of floodlighting installed by the company include the attractive Jephson Gardens display at Leamington Spa.

Vauxhall Motors Ltd.

The company's outdoor exhibit is comprised of four Bedford tower wagons, with bodies and equipment by Eagle Engineering Co., Ltd. Each wagon carries a similar type three-stage hydraulically operated tower to which is permanently fitted a telescopic ladder. Towers have a lowered height of 13 ft and extended height of 25 ft. Each wagon is provided with workshop facilities.

Venner Ltd.

A complete range of flashing and lighting equipment provides a topical feature of this company's stand. Of the plug-in design, the flasher unit is driven by a synchronous motor, and is self-starting. In addition, the lamp on either side of the wiring can be synchronised to within $\frac{1}{32}$th of a second. Forty cycles per minute is the flashing rate, accurate to within $\pm 10\%$, each on and off period being 0·75 seconds. The unit can be fitted in either pole top collet, strap-on base or Gowshall type root mounting boxes. It is understood, however, that, at the time of going to press, Venner Ltd. were still awaiting Ministry of Transport approval. Also on view is their latest nine-hour, solar-dial, spring-reserve time switch. This, the "T.J.S.S.P.," is stated to eliminate the need for constant resetting resultant from supply fluctuation.

ADMIRALTY ENGINEERING

Approval Tests and Basic Research at West Drayton Laboratory

FOR the first time, we received last week an invitation to visit the Admiralty Engineering Laboratory at West Drayton. The work carried out there is a combination of research into the special problems relating to equipment for naval service together with a wide range of prototype approval to the Navy's rigorous standards. Both the mechanical and electrical fields are covered in this laboratory but in this review it is only the latter that will be described. Nevertheless, it is relevant to point out that considerable work is being undertaken in the mechanical section on factors affecting gas turbines. In particular, a detailed study is being made of deposits on gas-turbo blading.

Batteries

The Navy is an exceptionally large user of batteries of all types so it is natural to expect an extensive section devoted to this work. For dry batteries, the major study is concerned with investigating the performance for the purpose of extending the shelf life. Facilities are available for testing under various conditions of temperature and humidity, but one of the main difficulties in this work is the lack of repeatability of the performance of batches of cells. Of the more recent introductions under test is the complete casing of the dry cells in polythene; preliminary results suggest most favourable performance under humid conditions.

Of a more fundamental character is the investigation being undertaken into the deterioration of zinc casings of cells due to corrosion in storage. This work is in an early stage and is at present concerned with the preparatory work of determining the effect of varying concentrations of ammonium chloride on rate of corrosion.

A substantial number of alkaline batteries are used on shipboard for emergency lighting. To avoid the need for periodical recharging, an investigation is being made into the possibility of using trickle charging. This has been found to be possible where the discharge from the battery has been small, but so far this method has not been found satisfactory where the battery is fully run down and work is proceeding to overcome this difficulty. In the case of lead-acid batteries some difficulty is arising in the suitability of wood separators. Several alternative materials are proving satisfactory, including microporous rubber and p.v.c.

Shock Testing

It is impossible not to be appalled at the treatment given to electrical equipment for this is aimed to simulate possible conditions arising in action. The equipment to be tested is mounted on a frame supported by substantial springs and with an anvil above. The whole is then subjected to the impact of a weight of 400 lb falling from a height of several feet and a similar blow is then repeated in two other planes. Only by resilient mounting can this performance be achieved and to demonstrate the adequacy of suitable mountings, an Admiralty pattern lamp is shown in a standard Admiralty well glass fitting with a resilient fixing designed in the laboratory. This lamp remained alight although subjected to several such impacts.

However, the introduction of resilient mountings brings with it the possibility of resonance under the vibration encountered on shipboard. Consequently, electrical equipment has also to pass vibration tests over the range of 0 to 14 vibrations per second.

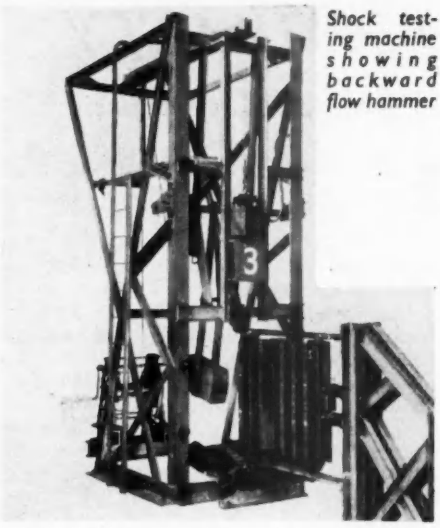
The present policy of employing 440 V 3-phase distribution in all new warships is reflected in the work of the switchgear department, nevertheless the major part of the work

Battery selector board for switchgear testing

of the laboratory continues to be on d.c. Thus, the high rupturing d.c. test plant has recently been enlarged to permit of tests up to 880 V and currents up to 120,000 amp. The supply for such tests is obtained from submarine type batteries with a selector board adjacent to the battery room for series-parallel switching.

While many of the familiar commercial test procedures are to be seen, one of the most characteristic features of the laboratory is the novel test rigs designed to simulate the special conditions on warships. In the case of cables for instance, not only are they required to be fire and oil resisting but when used in turrets and director towers they have to undergo repeated bending and twisting and accordingly tests have been devised for these characteristics.

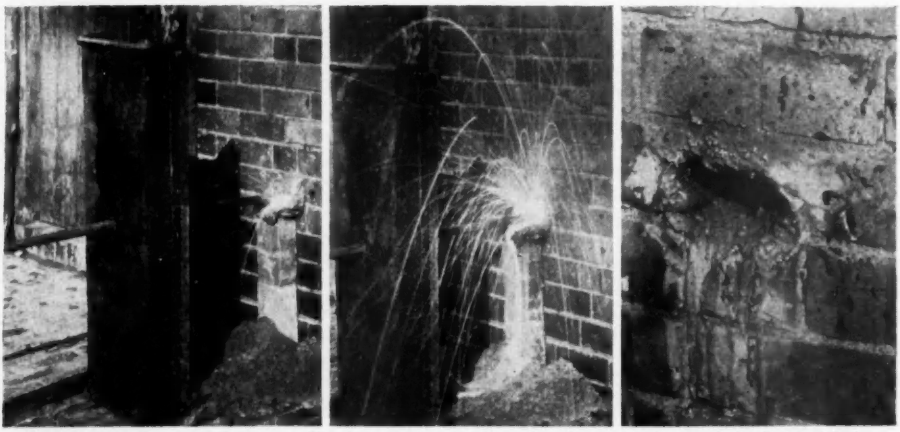
The advantages of fluorescent d.c. lighting have been made available for use under the difficult conditions in warships by the use of special mountings designed in the illumination department.



Shock testing machine showing backward flow hammer

Boring through Concrete

A NOVEL thermic borer which will pierce a 9-in. wall in 90 seconds, has been developed by two members of the staff of the Midland Electricity Board—Mr. R. Eckersley, ASSOC.I.E.E., Birmingham (North-West) district manager, and his foreman, Mr. W. Watts. The borer consists of an iron tube which is tightly packed with iron wire of about 0·125 in. gauge, one end being connected to a controlled oxygen supply and the other pre-heated to red heat with an acetylene flame. Oxygen is then applied via the iron tube causing the end of the tube—or lance—to fuse. When the lance is applied to concrete or brickwork the temperature attained is so high—up to 1,400° C.—that the stone or brick is melted. The system is, of course, a development of the principle used in cutting steel billets. The Board has now put the device into commercial use, and it has been found that there is less strain on the operator than when using a normal electric drill. For use in confined spaces, a box shield has been devised to protect the operator. And believing that there are applications for it in other industries, *Target*, the bulletin on productivity issued by the Central Office of Information, has given further publicity to the device.



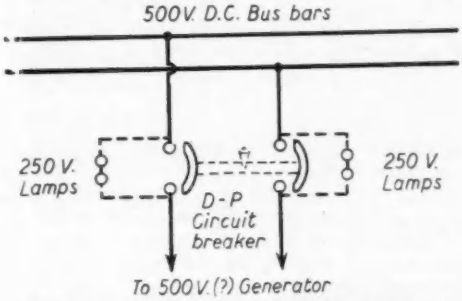
Operations shown in 3 stages: The lance enters brickwork; the sparks fly, and the finished hole

Problems and Practice

IN ENGINEERING

Paralleling Solution

WITH regard to H.G.'s paralleling trouble with moving-iron voltmeters (Problems and Practice in Engineering, Aug. 28), I should like to suggest the following as a simple way of overcoming the difficulty. Assuming there are no knife switches in addition to the circuit-breakers, the requisite number of lamps connected as in the diagram would not only show that the generator was building up with reversed polarity but probably prevent this occurring. The lamps would, of course, have to be removed in the event of any work being carried out on the generator.



The diagram illustrates the connections of the lamp across the circuit-breaker to check the polarity of the generator

The sum of the lamp voltages must not be less than twice the generator voltage. With the machine not generating the lamps would give a dull glow. If the polarity is correct when running up they would gradually go out altogether and the voltmeters could be safely used. If the polarity is reversed the lamps would increase to full brightness as the machine built up.—*A. J. B. Gosling.*

Misleading Test Lamps

THE misleading results reported by W. J. V. MacCorkell (August 21, 1952) when using a test lamp to check a 3-phase supply are commonly experienced. It is not sufficient to test the supply to earth (or neutral) from each phase, nor is it sufficient to test the supply between phases: either test alone can be misleading. Even the whole six checks R-E, W-E, B-E, and R-W, W-B, B-R, have been known to indicate a sound supply when in fact one phase was disconnected by a blown fuse. This occurred on a supply to an industrial consumer, and was probably caused by a large induction motor being allowed to run while "single-phasing." The blown fuse was eventually discovered by that useful test of connecting a test lamp across the fuse.

A dangerous trap occurs when the supply fails to a single-phase consumer. Using test lamps an electrician might test the supply between the incoming wires and find it dead. At this stage he could assume that it is safe to handle the wires since the reported failure has been confirmed by his test. A second test to earth may reveal that both wires are alive at the same potential—that is not an uncommon fault.

The procedure to be followed is, therefore, clear: always check the potentials both between lines and to earth.—*J.G.B.*

Lamp Testing

IN your issue of the ELECTRICAL TIMES, August 21, 1952 under "Problems and Practice in Engineering," reader W. J. V. McCorkell, has submitted a letter on the "Imperfections of Lamp Testing." I regard the method of using a 230-volt test lamp to earth on a 400-volt three-phase supply as extremely dangerous practice and do not think that it should be allowed to pass without comment.

If an earth fault should occur on one phase whilst testing one other phase to earth, a voltage of 400 volts would be impressed across the 230-volt lamp, probably resulting in the lamp exploding in the electrician's face.

In my works I do not allow 230-volt test lamps to be used. I use a testing set of two-230-volt 15-watt lamps in series and mounted in a small box, and also employ fused testing prongs which can be obtained from most reputable manufacturers.—*W. Fennell.*

Contributions to this page dealing with specific items of interest to electrical engineers and maintenance men are welcome, and, if accepted, will be paid for at our standard rates. Problems of a practical nature to which a solution is required will also be considered. Contributions should be written on one side of the paper only and may be accompanied by sketches, which will be re-drawn for publication.

The "Nevitron" is *NEW!*

This rectifier embodying many fundamental changes affords closer, more efficient control

EXACTLY five years ago, the Nevelin Electric Co., Ltd., initiated a programme of research and development from which has emerged the "Nevitron", a single-anode mercury arc rectifier of unique design. Work was started under Dr. von Bertele to attempt to cut down the size and weight of the conventional multi-anode rectifier.

A reduction in size of a cathode pool rectifier together with a lower arc drop can only be effected by controlling the mercury vapour emitted from the tube, so that there are no large unwanted clouds of vapour condensing on anode or grid with resultant anode-grid arcing. Heat generated at the cathode spot is the cause of evaporation and hence to reduce evaporation requires effective extraction of this heat. Due to the erratic movement of the spot in the conventional rectifier, it is virtually impossible to remove the heat generated. If, however, the position of the spot can be fixed, then removal of heat presents a lesser, though not easy, problem.

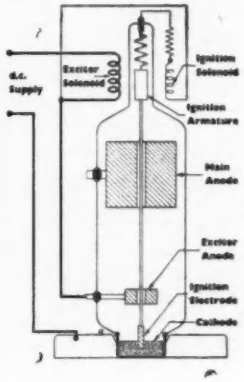
In the "Nevitron" the makers have used as a reservoir container a molybdenum cup, which when subjected to certain treatment will allow its surface to be wetted by mercury. Hence round the edge of the mercury level is a concave miniscus at which the cathode spot is located. Under full load the cathode spot becomes a continuous ring round the edge of the mercury.

Having fixed the position of the spot, the next problem to be considered was that of removing the excess of heat. This has been accomplished by fitting round the cup a thick annular ring of copper pressed into radial cooling fins of aluminium alloy. For small sizes this provides sufficient cooling but for larger sizes forced air cooling over the fins becomes necessary.

This construction enables the "bulb" of the rectifier to be fashioned as a cylindrical glass tube sealed to the molybdenum cup. This latter is prepared by a spinning process from ductile material and a glass ring is sealed to it to facilitate its final sealing to the main envelope. The anode, in a simple rectifier, is mounted from 4 to 6 in. above the mercury pool. Interposing a grid between anode and cathode increases the overall length and such a rectifier, combining controlled evaporation and short arc length, exhibits characteristics similar in character to a thyratron.

With the construction, as shown in the accompanying diagrams, new ignition and arc-maintaining systems become necessary. The arc-maintaining anode is mounted below the main anode and through both anodes passes a metal rod suspended from the top cap by a spring and touching the mercury in the pool. This rod forms the ignition anode.

Mounted round the top cap is a double solenoid, one winding of which is connected in series with the ignition electrode and the other in series with the arc-maintaining or exciter anode, as shown below. Current from a separate d.c. supply passes through the ignition winding and electrode. The armature mounted on the upper end of the rod is drawn up into the top cap by the magnetic force from the solenoid, breaking the circuit and striking an arc at the point where the electrode leaves the cathode. The ex-

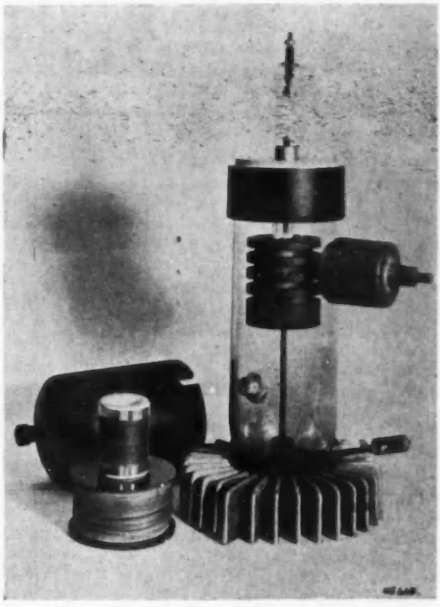


This diagram explains the ignition and excitation systems

citer anode then maintains the arc, the magnetic force set up by the current flowing in its own solenoid holding the ignition electrode clear of the mercury.

The construction is robust and the "Nevitron" has withstood onerous shock and vibration tests. Moreover, it is portable, the use of alloy fins keeping its weight down to 2½ lb, excluding the ignition coil. Its performance couples reliability with a high overload capacity and with the short arc length the arc drop is reduced to 12½ V compared with that of 18-22 V for the conventional rectifier.

Sizes already made are for operation at 500 V with a full-load current rating of 50 amp. Although production is only on a laboratory scale at present, delay in obtaining world patent rights has so far prevented the company from marketing the rectifier. For heavier current operation it is possible to connect rectifiers in parallel but larger sizes are intended. Among possible applications, it is specially suited for variable speed motor control. Moreover, if desired for use with grid control, the power taken by the grid circuit is about one-thousandth that of the conventional type, so that the grid voltage may be supplied by electronic equipment.

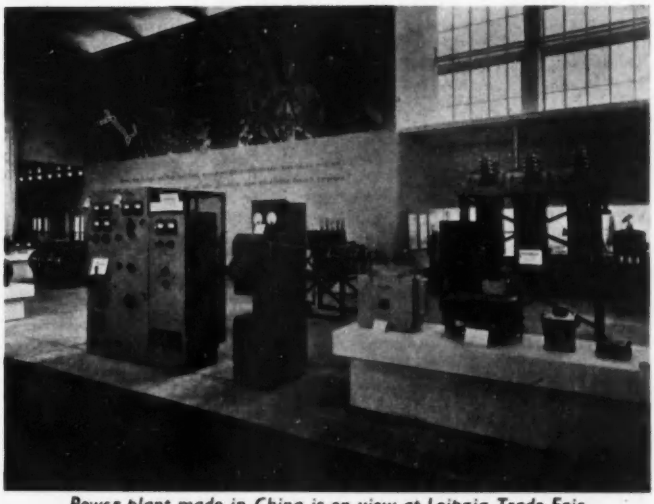


The single anode valve with upper cap and coil removed

Power Plant Made in China

CHINA, in legend, the land of the kerosene lamp, has startled many by the display of Chinese made power plant at the Leipzig Fair in Eastern Germany.

Equipment exhibited includes distribution transformers (50-200 kVA), T.C. type switchboards, synchronous generators (100-5,000 kW), induction motors 3-ph. squirrel cage rotor type, some drip-proof and others totally enclosed (fan-cooled), besides ammeters, voltmeters and other types of multi-test meters.



Power plant made in China is on view at Leipzig Trade Fair

She has engaged in extensive research work on the manufacture of cables, now supplying her own needs, and on the production of high tension insulators for the development of her national grid system.

Manufacture of the electrical equipment is mainly centred in Manchuria and Shanghai, but in accordance with Government plans, factories are being established in the more remote parts, particularly in north-west China.

overseas news

N.S.W. Electrification

Farmers were urged to take greater interest in, and give financial backing by means of local loans, to any speed up in rural electrification work by Mr. F. H. Hughes, supervising engineer (electrical) of the New South Wales Electricity Authority, when addressing members of the N.S.W. Agricultural Bureau at their annual conference recently. Although there had been much comment in recent times about electricity shortages, statistics showed that electricity production over the past ten years had far outstripped production of other basic commodities, he stressed. Referring to the rural electricity subsidy scheme he said it had been initiated in 1946 and provided for a 10-year programme in which 24,000 farms and 10,000 other consumers were to be connected at an estimated cost of £6,000,000—about half to be provided by way of subsidy. So far 15,000 farmers had received supply. Nearly 8,000 miles of line had been erected at a cost of £3,600,000. The State total of farm connections had been raised to 31,000, and of the total of 71,000 farms in the State, well over 40% were now connected.

Richmond on Load

The largest generator yet installed in Victoria—at least until the new 50 MW sets at Yallourn are put into service—was brought into operation a few days ago at Richmond power station of the State Electricity Commission. A Swiss-made 38 MW machine, it is to be powered by two Velox oil-burning steam-raising units, although only one is yet in service. Each boiler delivers 168 klb/hr at a temperature of 850° F and 600 lb/sq in. Initially the set is operating at half power until later this year, when the second Velox boiler is expected to be in operation.

For the Richmond power station, a 47,500 kVA Hackbridge transformer was ordered, one of the largest ever purchased by the Commission, to step up the 11 kV output of the new plant to the standard 22 kV of the distribution system.

Development

The power supply to north-west coast areas of Tasmania will be considerably improved very shortly as a result of additional substation capacity and the raising of the transmission voltage from 85 kV to 110 kV by the State Electricity Commission. The capacity of the Railton substation has been doubled, while a new 15,000 kVA substation has been erected near Burnie. The Commission reports that other new substations will also shortly be in operation. It adds that the number of consumers on the north-west coast had increased by 8% during the past year, compared with a State average increase of 6·9%. Consumers in rural areas during the year had gone up by 3,397, the increase in the State being 5,682.

Alaska Scheme

The Aluminium Co. of America has now announced plans for a $400 million plant at Skagway, Alaska, on which work may be commenced next summer or late next spring. The ultimate cost of the new smelting plant might go as high as $700 millions after the second proposed power plant is built. The smelting facilities and electric power developments necessary to operate them will be situated in the Taiya Valley, about 10 miles from Skagway. The plant will take about four years to complete. Hydro-electric power will be generated by damming the Yukon River at Miles Canyon, near Whitehorse. Water from the reservoir will be carried under the Rocky Mountains through two tunnels to the Alcoa power houses. Electricity generated will be used to smelt aluminium from ore brought by ship from South America. Each of the proposed power houses will make possible the annual production of 200,000 tons of aluminium.

Seaway Discussion

At the hearings of the International Joint Commission earlier this month, the State of Pennsylvania became the first "full-fledged" opponent to the development of the St. Lawrence seaway and power project. That State was chiefly opposed to the seaway phase, but as for the power project, it was contended that the private power companies had shown the ability to adequately supply all power demands. A new transmission possibility was suggested by Mr. J. E. Burton, chairman of the New York State Power Authority. He said Canada might take more than half its share of the power at the St. Lawrence site, near Cornwall, but return that equivalent in power to neighbouring states over other lines already in existence. In that way, he said, transmission costs would be saved on both sides of the border. The Power Authority officials were confident their agency would be named to construct and operate that part of the project within the U.S., he said. However, President Truman, in Washington, said that since Congress had turned down the project it was left to New York for the United States and Ontario for Canada to develop the power. But that statement indicated that during the remainder of his tenure of office there would be no move to establish a separate federal agency, similar to the T.V.A., to handle the St. Lawrence project.

The Commission holds its semi-annual executive meeting in Ottawa on October 7, when it is expected to fix dates for final hearings on the Seaway scheme.

Portugal's 6-Year Plan

A further development plan to be carried out during the next six years, has been announced by the Portuguese Government. The plan provides for a total investment of 13,500 million escudos, of which 7,500 million will be allocated to Portugal itself and 6,000 million to the different colonies and overseas territories in Africa, India and the Far East. The plan is to be submitted to the National Assembly for approval at the next session, which starts in November. As far as continental Portugal is concerned, the largest single group of investments —2,430 million escudos—is concerned with hydro-electric power projects and electricity transmission and distribution. In this plan four schemes are contemplated, two of which have already been started. The increase in power production is expected to amount to 1,210 million kWh by 1958, and at the same time the transmission and distribution system will be further extended. For overseas developments, a hydro electric scheme is to be carried out on the Canene River at Matala, in Portuguese Angola. Additional finance is also to be provided for the two hydro-electric schemes now in progress, the Mabuba near Luanda, and the Biopio, near Lobito, projects. The Mozambique investments include two hydro-electric schemes—one to be carried out at Movene, near Lourenco Marques, and another now being completed at Revue, near Beira. The plan also provides for the continuation of the examination now being made in agreement with the British Government on the hydro-electric possibilities of Lake Nyasa.

Belgium's T.V.

Technical specifications for a television service for Belgium have been finally announced by the Government. The scheme approved is an attempt to compromise between the Flemish insistence that Belgian TV should adopt the Dutch 625-line definition and Walloon preference for the 819-line definition as used in France. There are to be two services, a Flemish language transmission on the 625-line system and a French language transmission on the other method. But both systems will use positive modulation and a wave channel of 7 Mc/s. As Dutch transmissions are negatively modulated and the French system employs a waveband of 14 Mc/s, TV sets built to receive either French or Flemish language transmission in Belgium will not, without modification, be able to receive programmes in the same language from France or the Netherlands.

New Distribution System

The shortage of cable jointers (a shortage that seriously threatened Bulawayo's electricity distribution system a few months ago) is over, and work is now progressing on a 33kV outer distribution circuit. This new circuit will greatly ease the load on the existing 11 kV system. It will also reinforce the supplies of the Electricity Supply commission of Southern Rhodesia. The Bulawayo City Council has brought about the rapid improvement by obtaining the services of a cable jointing specialist, who has been instructing employees at the power station. Until the arrival of this engineer, several miles of h.t. cable had lain unjointed for many months in the bed of a 4-mile trench running from the power station to the new Marvel substation.

Pakistan's Projects

Three major hydro-electric projects—Karnafuli, Mianwali and Warsak—have been finally approved by the Pakistan Economic Council. These projects were approved by the Planning Commission and were recommended to the Economic Council in July. It is now expected that work on the schemes will start shortly. The Council has also authorised the Provincial Government to carry out a survey of the Ganges-Kobadak scheme in East Pakistan. Another project the Taunsa barrage scheme, from which 100MW would be generated, has been approved by the Pakistan Government Planning Commission and passed to Central Economic Council for approval.

From Pakistan there is also news that a Power Development corporation may be formed, to function on the lines of the Industrial Development Corporation. The proposal suggests either one such body for the whole country or one for each wing of Pakistan.

Guiana Expansion

The Demerara Electric Co., Ltd., British Guiana, has embarked upon a scheme to expand its power generating facilities, under the capacity of its Kingston power station, to 12,250 kW. The scheme entails the installation of a 70,000 lb/hr John Thompson water tube boiler, to operate at 450 lb/sq in. and steam superheated to 700° F, together with a 5,000 kW Fraser and Chalmers-G.E.C. turbo-alternator. The latter concern are also supplying the necessary switchboard and generator control gear. To provide extra circulating water, additional pumping facilities will be provided. Here, a unique feature will be a "back-washing" or reversal-of-flow system whereby the interior of the 24 in. pipes will be kept free of marine growth which is very prevalent in the area. Foundations for the new extension, involving reinforced concrete mats mounted on piles, are being constructed, and it is hoped that the new plant will be in operation late in 1954.

Japan's Plan

The inaugural meeting is being held this month of a new power resources development concern for Japan which has been set up by the Ministry of International Trade and Industry. Under the latter's plan, the new organisation will have an initial capital of 5,000 million yen, all of which is to be provided by the Japan Development Bank.

PERSONALITIES

IN THE INDUSTRY

The British Thomson-Houston Co. announce the appointment of **Mr. K. G. Leach,** M.A.(cantab.), A.M.Inst.C.E., A.M.I.E.E., as manager (plant and apparatus, South Western area, London district) sub-office, at 25 Baldwin Street, Bristol. He was first associated with the company as a student apprentice in 1939 while a scholar at Emanuel College, Cambridge, where he passed the Mechanical Science Tripos with honours. After his R.N.V.R. service he continued his apprenticeship course at the Rugby and Willesden Works, and in the Construction Department. Following two years training in commercial engineering, he was appointed power engineer, London district office, in 1949, a position he relinquishes to go to Bristol.

Mr. K. G. Leach

Mr. R. G. Kilburne, O.B.E., M.I.E.E., has been granted royal authority to wear the Insignia of the Second Class of the Order of Gorkha Dakshina Bahu, a decoration which has been conferred upon him by H.M. the Maharajadhiraja of Nepal, "in recognition of the valuable services rendered by him in the capacity of chief electrical and telephone engineer and chief engineer of Ropeways Department to the Government of Nepal."

Newly appointed publicity manager of Holophane Ltd., in succession to **Mr. R. J. W. Briddon,** who now represents the company in the south western area, is **Mr. G.A.T. Burdett,** A.M.I.I.A., M.I.A.M.A., who is already well known in the industry. Mr. Burdett was a sales engineer with Central London Electricity Ltd., and the North Wales Power Co., prior to the war, and was one of the first recipients of E.D.A. Sales Engineers' Diploma. After the war he had electrical editorial experience with Odhams Press, and following a period as public relations officer with the Plessey Co., was appointed publicity manager to the Dowsett group of companies. Immediately prior to joining Holophane he was with Service Advertising Co., handling advertising for companies in the electrical and allied fields.

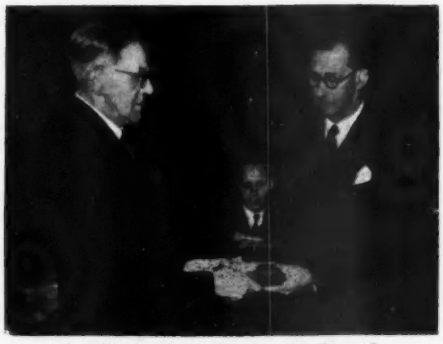
Mr. G. A. T. Burdett

Owing to continued ill-health and being under doctor's orders to rest for the time being, **Mr. H. A. C. Hassall,** Tipton Electrical Repairs, Ltd., has decided to resign the chairmanship of the Association of Electrical Machinery Trades. At a recent meeting of the Association it was decided that, unfortunately, there was no alternative but to accept Mr. Hassall's resignation, and the good wishes of his colleagues were sent to him with the hope that he will soon be restored to health. To succeed him, **Mr. J. A. Hardy,** of A.A. Electrical Co., Ltd., London, has been appointed chairman, and **Mr. G. W. Smith,** of Smith and Co., Carlisle, vice-chairman. Mr. Hardy has been an energetic worker on behalf of the association since its inception.

Mr. J. A. Hardy

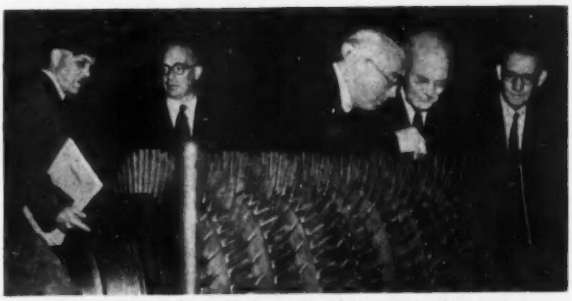
The Ministry of Materials announces that **Mr. Philip G. Smith,** of Bassett Smith and Co. Ltd., will be appointed Government Broker from October 1, 1952 for all sales of lead on the London Metal Exchange from Ministry stocks.

To mark the occasion of the award of the M.B.E. to **Mr. J. Stockwell,** director and works manager, the employees of Switchgear and Cowans Ltd., presented him with a silver casket specially designed to hold the Medal of the Order and a book containing the names of all subscribers. Our photograph shows the presentation being made by **Mr. C. Robinson,** who is still with the company after 54 years continuous service. Mrs. Stockwell, who was also present, received a gift of a handbag.



Mr. Stockwell, right, receives his gift

Sir Harold Hartley, K.C.V.O., C.B.E., F.R.S., Q.C., Chairman of the Electricity Supply Research Council of the British Electricity Authority, recently paid a visit to the Trafford power station where he inspected the 15 MW gas turbine installation which we described in last week's issue. Sir Harold was conducted round the site by **Mr. J. L. Ashworth,** the Divisional chief generation engineer (operation) in company with **Dr. J. F. Shannon,** Metropolitan-Vickers Ltd., Gas Turbine Section, **Mr. H. Audsley,** second assistant engineer, No. 3 sub-division, and **Mr. A. Binks,** electrical maintenance engineer, Trafford.



Inspecting the H.P. compressor of the gas turbine set

After being chairman of the General Council for the past two years, **Mr. H. Nimmo,** M.Inst.C.E., M.I.Mech.E., M.I.E.E., has been elected president of the Engineers' Guild in succession to **Mr. R. Chalmers,** O.B.E., B.Sc., M.Inst.C.E., M.I.Mech.E., whose term of office expires on September 30. Mr. Nimmo is, of course, chairman of the Southern Electricity Board and a part-time member of the B.E.A., but among his many other activities he is chairman of E.D.A., a member of the council of B.E.A.I.R.A., chairman of the B.S.I./E.D.A. advisory committee on electrical appliances and accessories, and a member of the council of the B.E.P.C.

Mr. H. Nimmo

The Sloan Electrical Co. Ltd., has appointed **Mr. L. G. Rayner** as sales representative for the North London area and he will operate from the company's depot at 6 Albany Road, Leyton, E.10. Mr. Rayner has been engaged for eleven years in various branches of the electrical engineering industry. Sloan have also appointed **Mr. W. Webster** as manager of their Edinburgh branch. He is already well known in Scotland.

Mr. L. G. Rayner

Mr. W. Webster

The chairman and managing director of Standard Telephones and Cables, Ltd., **Sir Thomas G. Spencer,** was entertained by twenty-five of his senior colleagues at a luncheon at the Connaught Rooms on Wednesday of last week, on the occasion of the 45th anniversary of his entering the company. In our accompanying photograph **Mr. E. S. Byng,** vice-chairman, is seen presenting Sir Thomas with a 45 years service badge.

Sir Thomas, left, gets his service badge

The South Western Electricity Consultative Council, at its meeting last Friday, passed a resolution deeply regretting the proposal of the Minister of Fuel and Power to terminate the appointment of **Alderman H. J. Perry,** of Plymouth, as chairman of the Council. The meeting also decided to ask the Minister to consider appointing Ald. Perry, in recognition of his four years' service as chairman, as an ordinary member for a further term.

OBITUARY

Mr. W. Smith, A.M.I.Struct.E., Assoc.I.E.E., section head (construction) in the Northern subarea of the London Electricity Board, died on September 11, aged 61.

Mr. G. W. Lawrence, president and general manager of the Sangamo Electric Co. of Canada, Ltd., died on September 9.

Mr. K. A. Thomson, a director of A. H. Hunt (Capacitors) Ltd., died on September 8.

PRESIDENT & CHAIRMEN

for the

1952-53 SESSION OF THE

INSTITUTION OF ELECTRICAL ENGINEERS

Col. B. H. Leeson, the President

THE next few weeks will bring the opening of the 1952-53 session of the Institution of Electrical Engineers—the presidential address will be delivered on October 9—and in conformity with our usual practice, we now give some brief details of the background of the new president and of the chairmen of the sections and local centres. This session's president, Col. B. H. Leeson, O.B.E., T.D., M.I.E.E., has proved an extremely popular successor to Mr. Victor Watlington as director of B.E.A.M.A., since taking over that office in October, 1946. He started with Siemens Brothers Dynamo Works Ltd., but after war service, accepted an invitation of the late Mr. H. W. Clothier in 1919 to join A. Reyrolle and Co., Hebburn, where he continued till 1946. There he was intimately connected with the establishment of the first short-circuit testing station in Britain in 1929, and subsequently with the standardisation of switchgear performance. He ultimately became managing director of Reyrolles in 1945 and a director of a number of associated concerns.

Regarding the London Sections of the Institution, Mr. C. M. Cock, M.I.Mech.E., M.I.E.E., a recognised authority on electric traction matters, is chairman of the Supply Section. Until two years ago, he was chief electrical engineer to the Railway Executive, and since then, as manager of the Traction Department of the English Electric Co., has played a prominent part in that company's increased activity in the export field covering both electric and diesel-electric locomotive and traction installations. Born in Melbourne, he gained early railway electrification experience there with Merz and McLellan and later in India, but in 1945 he came to England to take up the post of chief electrical engineer to the Southern Railway, and on nationalisation of the railways in 1948, was appointed to a similar position to the Railway Executive.

For the Measurements Section the chairman is Dr. L. Hartshorn, D.Sc., A.R.C.S., D.I.C., M.I.E.E., who has been at the National Physical Laboratory since 1919. There he has worked chiefly on precision electrical measurements, electrical standards, and dielectrics, including fundamental work on dielectric losses and applications to varied problems in plastics, dry-cleaning, moisture-meters, and radio-frequency heating. Earlier this year, he was a member of the Comite Consultatif d'Electricite, a small international committee on electrical units, etc.

The chairman of the Radio Section, Dr. E. C. S. Megaw, M.B.E., D.Sc., B.Sc., M.I.E.E., has been prominent in radar research for the Admiralty for many years. His early studies, while at the G.E.C. Research Laboratories, on transit-time oscillators for the highest frequencies, which pointed to the magnetron as the most promising device, his account of which gained the Duddell premium in 1933, was also the starting point of a long association with what was then the Experimental Department of H.M. Signal School. But more recently he was responsible for the G.E.C. contribution to the war-time studies of centimetre wavelength propagation. In 1946 he became superintending scientist at the Admiralty's S. and R.E. and later superintendent of research there, a post he held till 1951 when he became director of physical research at the Admiralty.

An internationally famous authority on illumination matters, Dr. J. W. T. Walsh, O.B.E., M.A., D.Sc., M.I.E.E., is chairman of the Utilisation Section. Although he retired from the position of senior principal scientific officer of the Electrical Department of the N.P.L. nearly a year ago, he still takes a very active interest in electrical matters, particularly illuminating engineering. He has served on many Government Committees on various aspects of illumination, has been vice-president of the International Commission on Illumination, and is also author of many works on lighting,

photometry, and allied matters.

Turning to the local centres of the I.E.E., for the Mersey and North Wales Centre, Mr. W. A. Hatch, M.B.E., M.I.E.E., A.M.Inst.C.E., A.M.I.Mech.E., is the chairman; he has been electrical engineer to Pilkington Bros. Ltd., the glass concern, for a number of years. His early training was gained with Mersey Docks and Harbour Board, and Dick, Kerr and Co. Joining the North East Coast Electric Supply Co. as an assistant engineer, he afterwards served in a similar capacity with Burstall and Monkhouse, of London, before going to Pilkington's.

Another engineer in industry is chairman of the East Midlands Centre—Major H. E. Knight, M.I.E.E., who has been chief electrical engineer at the Tube Works of Stewarts and Lloyds Ltd. at Corby since December 1933. Whilst at Corby he has been responsible for the layout and organisation of the Tube Works electrical equipment, and also for similar works at Newcastle, New South Wales. He was commissioned in 1933 in the Supplementary Reserve, Royal Signals, and served in Europe in the last war. His activities during the latter part were dealt with in his paper: "The Reconstruction of the Italian State Telecommunications System 1943-45" which was read before the centre last year.

Mr. H. Leyburn, B.Sc.(Eng.), M.I.E.E., the chairman of the North Eastern Centre, has been head of Reyrolle's Research and Certification Department since 1948. His early years were spent with the B.T.H. Co. and Ferguson Pailin Ltd. before joining A. Reyrolle and Co., in 1927. He first concentrated on protective gear research and development in what was then known as the Technical and Research Department and became Section Leader in 1932, and promoted to deputy head of the Department in 1938. In his 25 years with Reyrolles he has been sole or joint inventor in over 50 patents. He has also served on various B.E.A.M.A., B.S.I., E.R.A., and I.E.E. committees.

The chairman of the North Midland Centre, Mr. H. S. Moody, B.Sc.(Eng.)., A.C.G.I., M.I.E.E., is a section head in the chief engineers' department of the Yorkshire Electricity Board, having been technical assistant to the general manager of the Yorkshire Electric Power Co. at vesting day. Earlier experience was gained with the J. L. Eve Construction Co., from 1930 to 1934 as a construction engineer, and from 1934 to 1940 with Standard Telephones and Cables Ltd., where he was in charge of the Power Cable Engineering Department and later the corresponding Installation Department.

(*To be continued*)

Reading from the top downwards and to the left are: Mr. C. M. Cock, Dr. L. Hartshorn, Dr. E. C. S. Megaw, Dr. J. W. T. Walsh, Mr. W. A. Hatch, Major H. E. Knight, Mr. H. Leyburn and Mr. H. S. Moody

NEW LITERATURE

Materials Handling in Industry

A SHORT while ago we reviewed in the columns of this paper a film which the British Electrical Development Association had commissioned to show how better materials handling methods can increase productivity and at the same time improve the workers' lot. Now, as a further item in its plan to step up productivity, the Association has produced a book which has the same aim, and is, indeed, marked by a similar standard of practical helpfulness.

As is appropriate to a volume intended for the unconverted, the early chapters are concerned with the benefits that may be expected from mechanical methods of materials handling, and with the basic techniques concerned. Then come a series of chapters dealing with the various types of equipment concerned, both as regards typical applications and details of operation. The result is a handbook which should be of the greatest value to production engineers in all branches of industry. Published by the British Electrical Development Association, 2 Savoy Hill, London W.C.2, 142 pages, 8½ in. by 5½ in. Price 8s. 6d.

Electrical Communications Experiments

by H. R. Reed and others.

ESSENTIALLY this book is a laboratory manual of some 60 experiments on general electrical engineering and radio work. It can justly claim to be more than this, however, for a detailed description of the experimental methods involved is accompanied by lengthy theoretical discussions of the phenomena under investigation. The volume is made more valuable by the discussion at the beginning of the accuracy of electrical measurements and the uncertainties involved in making them, and of suggestions for the preparation of reports. Published by Chapman and Hall, 458 pages, 9 in. by 6 in. Price 54s.

Dimensional Analysis

by H E. Huntley, B.Sc., Ph.D.

DIMENSIONAL analysis is not a subject which commonly excites great interest amongst electrical engineers, though they do meet its problems in their basic physics courses. In this volume Professor Huntley writes interestingly of the principles of this "by way of physics" as he calls it, and he brings out strongly the practical applications that they have. Electrical quantities and the difficulties, introduced by the existence of two systems—electric and magnetic—side by side, receive a chapter on their own.

An introduction to the whole problem of systems of units and the method of dimensions opens the book, and the notes here will be found extremely helpful to the student interested in examinations in the less advanced sections of the subject. Chapter 4, which contains a lengthy selection of simple examples, will also help this type of reader, while the preceding historical outline of the subject's development should interest all. Included in the latter part of the book is a discussion of the relation of vectors to dimensional analysis and particular consideration of the motion of fluids and vector quantities. In all, the volume should be a valuable addition to any technical library. Published by Macdonald and Co. (Publishers) Ltd., 158 pages, 8½ in. by 5½ in. Price 20s.

BOOKS RECEIVED

Radio Interference Suppression, by G. L. Stephens. Practical notes on technique. Published by Iliffe and Sons, 132 pages, 8½ in. by 5½ in. Price 10s. 6d.

Electric Circuits and Machines, by E. C. Lister. Textbook designed for elementary course. Published by McGraw-Hill, 427 pages, 9 in. by 6 in. Second edition, price 32s.

Drivers' Handbook, by R. E. G. Brown. Notes on the law for drivers of commercial vehicles. Published by the Traders' Road Transport Association, Ltd., 146 New Bond Street, London W.1. Price 1s.

Definitions and Formulæ: Electrical Installation Work, by F. P. Sexton. Published by Pitman, 30 pages, 5½ in. by 4¼ in. Price 1s. 3d.

Wood's Practical Guide to Fan Engineering, edited by W. S. Osborne and C. G. Turner. Published by Wood's of Colchester Ltd., 227 pages, 9 in. by 6 in. Price 10s. 6d.

Electrical Engineering (Theory and Practice), by W. H. Erickson and N. H. Bryant. Textbook for non-electrical engineering degree students. Published by Chapman and Hall, 523 pages, 9 in. by 6 in. Price 48s.

Wireless Fundamentals, by E. Armitage. Development of radio theory without advanced mathematics. Published by Pitman, 363 pages. 8½ in. by 5½ in. Price 18s.

Worked Examples in Illuminating Engineering, by R. W. Ames and J. B. Harris. Textbook for examinations of City and Guilds of London Institute, etc. Published by Macdonald and Co. (Publishers) Ltd., 238 pages, 8½ in. by 5½ in. Price 21s.

Hydraulics and the Mechanics of Fluids, by E. H. Lewitt. Degree standard textbook. Published by Pitman, 662 pages, 8½ in. by 5½ in. Ninth edition, price 25s.

Practical Industrial Electronics, by F. A. Annett. Descriptive book for operating engineers and electricians. Published by McGraw-Hill, 381 pages, 9 in. by 6 in. Price 47s.

Measurement of the Thickness of Capacitor Paper, by W. Sounder and S. B. Newman. Issued as U.S. National Bureau of Standards Circular No. 532. Published by Government Printing Office, Washington 25, D.C., 10 pages, 10½ in. by 8 in. Price 20c.

The BUYER'S *Column*

New Arcolectric Signal Lamp

ANOTHER development of ARCOLECTRIC, LTD., Central Avenue, West Molesey, Surrey, well-known makers of switches and signal lights, is the SL.86 lamp, which has just been introduced.

Arcolectric's SL.86

The signal lamp, which is easily fixed in a single ⅞-in. hole, has an attractive panel appearance. The holder is designed to accept all low-voltage m.e.s. lamps. Lenses are available in a wide range of colours, and are mounted in a chromium-plated bezel. Insulation on the lamp will withstand a flash test in excess of 1,500 V.

Price Changes

AN announcement of a reduction in price has been made by AERIALITE LTD., Castle Works, Stalybridge, Cheshire. The Model 56 T.V. aerial has been reduced to £4 12s. 6d. retail, whilst the Model 54 is now £5 5s.

The retail price of the "Deren" automatic electric toaster, made by DE RENZI, HOLMES & CO. LTD., Fox's Lane, Wolverhampton, has been reduced to £3 17s. 6d. each, subject to the usual trade discounts, as and from September 1, 1952.

Wholesalers will be credited with the difference in purchase price for any purchases made on or after March 1, 1952.

Venner's Lifebuoy Light

NEW introduction by VENNER ELECTRONICS, LTD., Kingston By-pass, New Malden, Surrey, is the Venner Lifebuoy Light.

It overcomes the necessity of repeatedly renewing dry-cell batteries, which usually deteriorate quickly in hot climates. The buoy itself is strongly built of steel and is Parkerised to render it rust-proof. Buoyancy is provided by an Onayote (non-absorbent lighter-than-cork material) body, whilst a lamphood constructed of unbreakable clear plastic is fitted.

The special Exide water cell is housed in the base of the light and is like that used by the Admiralty in the Davis escape apparatus. The cell holds its charge indefinitely and remains dormant until it comes into contact with water, either fresh or salt, when by chemical action it becomes active and provides current for lighting the lamps. Five seconds after contact with water the lamp lights and continues for 10-12 hours. The lamp is attached in the normal way to the lifebuoy which, on leaving its chute, drags the lamp with it. This action tears a soft soldered strip from the body of the lamp above the cell compartment, thus allowing water to enter and activate the cell.

New Era Use Rigid P.V.C.

FOLLOWING on the recent note in the ELECTRICAL TIMES concerning the development of P.V.C. rigid sheeting and its use in reflectors for fluorescent lighting, we hear that NEW ERA INDUSTRIES (TOTTENHAM), LTD., Stoneleigh Road, Tottenham, N.17, have now produced a single 80 W tube trough fitting incorporating rigid P.V.C. in the reflector.

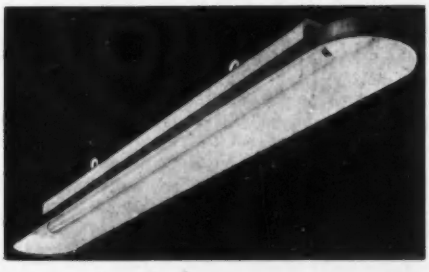
The fitting seen in our illustration has a formed steel spine, so made that the rigid P.V.C. reflector is easily detachable. Control gear is mounted within the spine and is easily accessible.

Prices are as per table below:—

Standard gear.	Quick-start gear.
Rigid P.V.C. reflectors	
80 W 5 ft SC/18T £8 18s.	QC/18T £9 14s.
80 W 5 ft SC/28T £12 15s.	QC/28T £13 19s.
Perspex reflectors	
80 W 5 ft SX/18T £10 10s.	QX/18T £11 6s.
80 W 5 ft SX/28T £14 18s.	QX/28T £16 2s.

Lamps are extra.

This single tube trough fitting by New Era has a rigid P.V.C. reflector



Hanovia's Latest—Model 7

A NEW addition to the range of sunlamps for domestic use made by HANOVIA LTD., Slough, is the "Prescription Model 7." It comprises separate ultra-violet and infra-red ray sources, contained in one 11 in. circular paraboloid reflector in alumilite. Each source has its own switch on the base of the lamp. The ultra-violet rays come from an extra high-pressure quartz mercury arc tube, consuming 100 W. The infra-red source is a radiant quartz emittor containing a coiled-wire resistance, consuming 500 W.

This combination has already proved very

popular as a table lamp, the "Prescription Model 6." In the new Model 7 it is mounted on a light telescopic stand with a castor-fitted tripod base. The stand has 27 in. of vertical travel, up to a height of 5½ ft, ideal for bedside use. The reflector is, however, hinged, so that the user could also lower the lamp and use it standing or sitting, if preferred.

The normal consumption of the lamp is 360 W (500 W maximum). It operates equally well on a.c. and d.c. mains. Finished in oyster-green enamel, very light and mobile, it is a notable addition to the Hanovia range of domestic sunlamps.

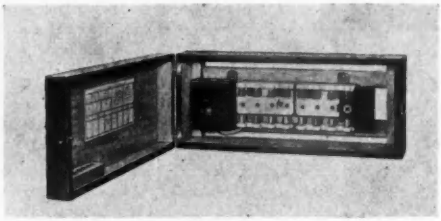
Intercommunication

FOR uninterrupted natural speech over loudspeaker intercommunication systems, COMMUNICATION SYSTEMS, LTD., Strowger House, 8 Arundel Street W.C.2, have developed the "Soundmaster," for which is claimed almost perfect quality reproduction. Moreover, absence of a speak/listen key enables freedom of movement whilst conversing.

Extension identification on the switch panel of the master is simplified by a lamp indication of the calling extension. Any call to a master may, in addition, be held, to enable a further call to be received. To obtain privacy of conversation a hand receiver can be used, automatically disconnecting the loudspeaker, and, if desired, the buzzer may be switched off, to ensure freedom from interruption. Other points of interest in this businessman's assistant are absolute priority of call for the master and full intercommunication between all instruments.

For inconspicuous installation, the small loudspeaker associated with each desk receiver can be located under the desk or in any other convenient site, and supply for the equipment is a.c. mains. A choice of light, medium or dark finishes is available in either mahogany or walnut.

Communication Systems' Soundmaster has a distinctive style coupled with its high efficiency



The Memera wood cased composite unit No. 8,000 KSW is for universal application

MEM's New Control Units

MODIFICATIONS to their range of consumers' control units have been announced by MIDLAND ELECTRIC MANUFACTURING CO. LTD., Reddings Lane, Birmingham 11. The principal change allows the installation engineer to vary the fuse-way ratings at will. The new arrangement has a common fuse base, to which may be fitted individual porcelain shields which will accept 5, 15 or 30 amp rewireable or H.R.C. fuse carriers, according to rating desired.

In the composite units, new six-way models are introduced and are available in boxes of sheet steel construction as well as in hardwood cases.

New combinations of fuse-ways are introduced as standard patterns in the composite units, but to allow the greatest freedom in selecting fuse arrangements, "universal application" units are available consisting of four-, six- or eight-way chassis with 60 amp d.p. switches, to which fuse shields and carriers to the consumer's individual requirements can be fitted.

G.E.C's Mercury and Tungsten Fitting

THE new F61016 combined mercury and tungsten lighting fitting made by the GENERAL ELECTRIC CO. LTD., Magnet House, Kingsway, W.C.2, has been scientifically designed to give similar light distribution from both light sources so that almost perfect colour blending is obtained. There is good upward light to conform with modern lighting practice. Installation is simple, since only the light top channel is fixed to the conduit, the reflector portion complete with choke being hooked on afterwards.

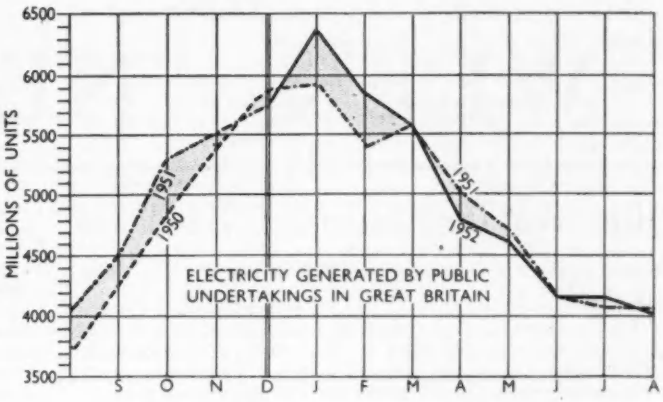
The main housing is of 20 s.w.g. sheet steel finished with red oxide and two coats of grey stove enamel. Inner reflectors are of anodised aluminium of a high reflection factor. The top channel is fitted with 2 G.E.S. skirted lampholders wired complete in asbestos-covered cable. A 3-pin plug and socket is fitted and wired for connecting the choke, which is housed inside the main reflector body. The lampholders are arranged for two fixing positions, so that any combination of lamps, 250- or 400-watt mercury and 500-, 750-, or 1,000-watt tungsten G.L.S. lamps, can be used. The fitting weighs 27½ lb. (44 lb. complete with choke).

UNITS GENERATED

4,034 million units was the total generated during August in stations under the control of the B.E.A., the North of Scotland H.E. Board, and the Lochaber Power Co. The corresponding figure last year was 4,122 million units, so there has been a decrease of 2·1% over the twelve months.

Of the total, 3,908 million units was generated in steam stations and 115 million units in hydro-electric.

Energy sent out during the months was 3,788 million units, 93·9% of that generated. This gives the total for the year so far as 37,185 million units, showing an increase of 1·1% on the first eight months of last year.



POWER SUPPLY IN AUGUST

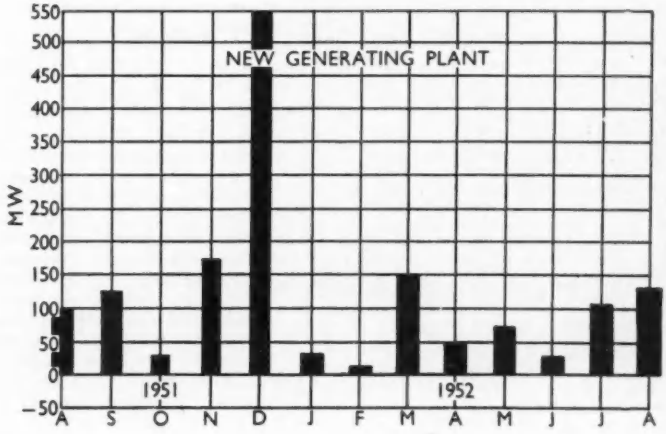
COMMISSIONINGS in B.E.A. stations during August were, as usual, few in number, but they represent a major addition to the capacity of the system. The largest set involved is a 75 MW B.T.H. machine, the first to be installed at the London division's Barking C station. Steam conditions here are the standard intermediate values of 900 lb/sq in., 900° F, and present plans provide for an initial installation of three such sets, supplied by six Babcock and Wilcox boilers.

The London division figures in the list again with a 180 klb/hr boiler brought into operation at West Ham B. This completes the present plans for steam raising in the first section of this station, and leaves only one set to come.

At Skelton Grange (Leeds) in the Yorkshire division, a third Parsons 60 MW set was commissioned. The turbines at this station are of three-cylinder design, with steam conditions of 900 lb/sq. in., 925° F at t.s.v. Three sets have still to come out of the planned complement.

Generation Down

Sales of electricity were again down during August in comparison with the previous years totals, so far as the B.E.A. was concerned, though in the case of the North of Scotland Board there was an increase of some 13%. The comparative figures for the B.E.A. will be more fully analysed later in the month when the figures for individual area boards are available. In the meantime it is of interest to note that the 2·1% drop in generation resulted in a fall of 7·3% in the quantity of coal consumed and of 13% in oil.



GENERATING PLANT

At the end of August, 1952, the installed capacity of the B.E.A. was 16,235 MW, showing an increase of 135 MW during the month. During this same period the North of Scotland total decreased by 1 MW to 643 MW. The month's commissioning figures bring the overall increase during the past twelve months to 1,417 MW, or 9·2% of the total at the end of August, 1951.

The total installed capacity used for the purposes of this graph should be distinguished from the output capacity. The installed capacity is the total m.c.r. of all the generating sets which are connected on both steam (if appropriate) and electric sides and are suitable for service.

The WEEK in NEWS

10 per cent Tariff Increase in Highlands

Costs up by well over £300,000 in past 18 months

AN increase of nearly 10% in tariffs with effect from the first meter reading after September 13, is announced by the North of Scotland Hydro-Electric Board. The rise was foreshadowed by Mr. T. Johnston, the chairman, in May last, but under the new proposals no consumer will be charged a higher average price per unit than the present maximum. The Board has also decided to introduce a charge of 6/- per quarter for prepayment meters. In announcing these revisions the Board points out that during the past 17 months there have been considerable increases in various costs and examples quoted are (*a*) the price of copper has gone up to £285 a ton; (*b*) the recent increase in interest rates from 3½% to 4¼% will cost the Board more than £100,000 this year and over twice that amount next year; (*c*) a further £37,000 will have to be found for local rates, which have recently been raised; (*d*) increases in wages and salaries account for another £101,000, and (*e*) the addition of 8/4d. per ton on the price of coal means a rise of £100,000 in fuel charges for the Board at the present rate of consumption. It is also stressed that the Board has not yet been under the necessity of increasing its standard prices when there has been a rise in the cost of fuel, and industrial consumers in the area, unlike such consumers in areas where fuel clauses operate, have, therefore, enjoyed stability in the price of electricity during the last 18 months.

LEAD ADEQUATE TO MEET NEEDS

THE Ministry of Materials has issued a statement concerning the disposal of Government lead stocks. It is not intended to release more than a relatively small tonnage for sale during the early months of the London Metal Exchange's operation. Nevertheless that tonnage will be adequate to meet consumers' requirements, it is stated. Metal to be disposed of will be available through the Exchange and through usual trade channels. The Ministry reserves the right to suspend selling when it is estimated that sufficient lead is available from private sources.

The First Half-Century

One of the most important sectional addresses to engineers at this year's meeting of the British Association at Belfast, was to be found under Section F, Economic Science and Statistics. The controversies of recent years in connexion with the progress of the engineering trades and manufacturers do not turn on technical questions mainly nor even on technical education, but on matters of foreign competition and legislative interference, on municipal obstruction and on well-meant but none the less mischievous schemes for solving the problem of housing the poor, where other well-meaning legislation has interfered with its natural solution.—*From our issue of September* 18, 1902.

GOVT. INTERVENES IN WAGE DISPUTE

THE ban on overtime and restriction on piece work, proposed to be enforced by 38 unions affiliated to the Confederation of Shipbuilding and Engineering Unions, was the subject of talks on Monday between representatives of the Confederation and Sir Robert Gould, chief industrial Commissioner of the Minister of Labour.

The decision to implement such a ban, at a date to be fixed, was reached at a meeting of executives of the unions last week. The ban will involve about 2½ million employees, the action being in protest against the rejection of wage claims by employers. As a result of Monday's talks invitations have been sent to employers' organisations to attend a similar meeting.

The principal dissentients to the ban—they suggested arbitration—were the T. and G.W.U. and the N.U.G.M.W.

A resolution put forward by the Electrical Trades Union calling on other members of the Confederation to adopt the policy of official support of any strikes on the part of their members was defeated.

Import Duties on Iron and Steel Goods

AN Iron and Steel (Exemption) Order, suspending import duties on certain iron and steel goods for a year, comes into force on Friday. This means that all imports of the goods concerned, which in the main are those purchased centrally by the British Iron and Steel Federation, whether made centrally or privately, will be free of import duties. The new order has no net effect on the position of the centrally purchased imports.

Move for More Pleasing Lamp Columns

A COMMITTEE of ten under the chairmanship of Mr. W. J. Worboys, director of Imperial Chemical Industries, Ltd., and member of the Council of Industrial Design, is at present meeting regularly to approve designs of new street lamp columns submitted to them by manufacturers. As from the beginning of this year the Council of Industrial Design, at the invitation of the Ministry of Transport, assumed responsibility for maintaining a list of approved designs of lighting columns which would be available for consultation by local authorities and other interested bodies.

The Committee's main purpose is to improve the daytime appearance of lamp posts (which has been criticised in some quarters), and at the same time it is hoped to have a good influence on functional aspects. It works in close liaison with the Ministry, Road Research Laboratory, A.P.L.E. and B.S.I. To date about 100 new designs have been examined and of these 48 have been approved and 52 referred back to the manufacturers.

Radio and T.V. Sales were Up in July

FOLLOWING a number of months during which sales of radio and TV sets have declined considerably it is something of a change to be able to report that an increase in sales occurred in July. The latest R.T.R.A. index shows that the average number of radio sets sold in July was 5·3 compared with 4·58 the previous month. This is still below the 1951 July figure of 7·24. TV sales showed an increase of 0·78 over June figures to 3·93. This total is also above the 1951 July figure of 3.07.

Course on Units

AMONGST special lecture courses being organised by the Electrical Department of the Municipal College, Portsmouth, is one commencing on Tuesday, September 23 on "The Rationalised M.K.S. (Giorgi) System of Units." This course, which is to be repeated later on Thursday evenings, follows the policy of the department in gradually introducing rationalised M.K.S. systems for all its work. Another special course will be held on the subject of "System Protection."

Infra-Red Lamp Causes Fatality

THE inquest took place at Scunthorpe last week on a 16-year-old boy who was found dead in a piggery at Low Risby beside an infra-red heating lamp. Recording a verdict of death by misadventure, the coroner said there seemed to have been a failure to comply with the recommended practice of the I.E.E., when the lamp was installed. During the course of the inquiry, Mr. T. Astin, a Y.E.B. engineer, said he thought that not only should the lamps be fitted with guards or shades, but they should be so situated as to be out of reach of workmen on normal duties. Following a similar fatal accident in the north-west, Y.E.B. engineers had been instructed to fit skirts in all future installations.

A Century of Indian Railways

NEXT year the Indian Railways celebrate their centenary and part of the activities being planned to commemorate the event comprises an exhibition covering some 60 acres near the Purana Quila (Old Fort) in New Delhi. The display is aimed at depicting progress made, services provided, importance to the country's economy and comparison with railways in other parts of the world. It is to take place between February 28 and April 16, 1953.

Manufacturers interested in full details of the exhibition are advised to communicate with the Railway Board, Ministry of Railways, in New Delhi. It is understood that exhibits should reach the site by January 15

New Cooker for Old

A NEW cooker of most recent design is being offered by Tricity Cookers Ltd. in exchange for the oldest possible sample available. Any person owning one of the company's models which is over 30 years old is asked to write giving the cooker's Model No., age and present condition. An appeal to this effect may be found in our advertisement columns.

Fittings supplied by the British Thomson-Houston Co. were used to floodlight Llandudno's Hydro Hotel. Eight Mazda '23' floodlights housing 140 W sodium lamps have been trained on the facade, while the name signs are highlighted by projectors employing tungsten and reflector spot-lamps

OFFICIAL PUBLICATIONS

ATOMIC ENERGY RESEARCH ESTAB. REPORTS.
G.R. 786: *Relation between Electron Current and Forward Target Radiation Intensity in High Energy Electron Accelerators* (1s. 9d.); T.R. 587, *Calculating Critical Dimensions of Spherically Symmetrical Reactors* (3s.); G.M. 92, *Effect of Surface Treatment on Electric Breakdown between Copper Electrodes at 50 c/s at very low Pressures* (2s. 6d.); G.R. 810, *Electromagnetic Resonators for Testing Dielectric Constant and Dielectric Power Factor of Discs of Titania Ceramic at about* 3,000 *mc/s* (3s.). H.M.S.O.

FACTORY FORM 386. *Warning Notice re repair of Drums or Tanks*. H.M.S.O., 2d.

IRON AND STEEL DUTIES (EXEMPTION) ORDER, S.I. 1670, 1952 (see page 512). H.M.S.O. 2d.

BRITISH STANDARDS
B.S. 1870. Men's Safety Boots and Shoes (see page 515).

IRON AND STEEL SCRAP ORDER, S.I. 1665. Consolidating Order Nos. 1-6. H.M.S.O. 9d.

64th LIGHTING COURSE

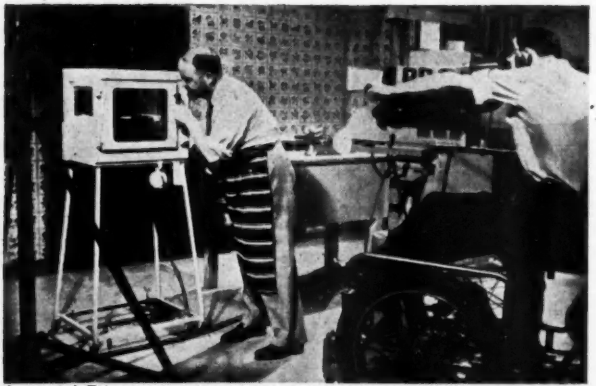
THE Sixty-fourth Illumination Design Course organised in London by E.L.M.A. will begin on October 20 at the Lighting Service Bureau, 2 Savoy Hill, W.C.2. There will be a total of seven lectures which will be given on successive Monday evenings. Briefly the lectures will be on "Electric Lamps and Circuits," "Floodlighting," "Shops," "Industry," "Offices," "Lighting Design" and "Homes." Admission will again be by ticket only obtainable on application to the Bureau.

ELECTRICITY OR GAS IN NEW HOMES?

REFERENCE has been made in these columns in recent weeks to the disagreement between the Scottish Gas and Electricity Boards over the latter's offer to Local Authorities of reduced charges for supplying and laying mains to new housing estates. The offer was to hold good provided it was agreed to install electrical appliances to the exclusion of gas. The Gas Boards resented the offer. Latest information on the subject is that a meeting is being arranged between representatives of Scottish Gas Consultative Council and their electrical counterparts in S.E. Scotland.

At a meeting of the Electricity Consultative Council last week, a letter from the Gas Council was read in which the writers strongly deprecated the offer and it was stated that the Ministry of Fuel and Power and Secretary of State for Scotland had been urged to consider the position with a view to ensuring consumers freedom of choice. A resolution to this effect had been submitted in February of last year but no action had been taken. The Electricity Council agreed to meet their opposite numbers in the gas undertaking.

A slightly different aspect of the same problem has been reported from Somerset, where representations are to be made to the Ministry of Fuel and Power, and Southern and S. Western Electricity Boards urging the introduction of some strictly defined limit of capital contribution levied on local authorities for housing projects. The decision arose because one Council notified the Boroughs and U.D. Councils Association that the S.W. Board had asked for £150, plus the cost of certain other works, for the provision of electricity to 32 dwellings. The Council, nevertheless, offers freedom of choice to tenants between electricity and gas for cooking and water heating. Other Councils were said to be in a similar position. As in Scotland the Board had offered to dispense with the service charge if the Authority undertook to supply 50% of the dwellings with electrical appliances. The Board has insisted that each site should be treated separately in calculating the capital contribution and would not offset other sites which might be more than remunerative. The Taunton delegate maintained that principles were involved and it would ultimately affect all authorities.



A special TV oven has been produced by Jackson Electric Stove Co. for use in B.B.C. programmes. Main feature of the cooker is its glass sides. Photograph shows Mr. P. Harben giving a demonstration

Appeal to End Ban on Shop Lighting

A NEW appeal for the cessation of winter restrictions on shop-window lighting, this time by traders in the West Country. At a recent meeting of the Plymouth Incorporated Mercantile Association, it was decided to ask the National Chamber of Trade to pass on their views to the Ministry of Fuel and Power. The chairman, Mr. F. A. S. Abbott, stated it was customary for the Minister to issue an order on the subject at this time of year, and consequently a strong expression of opinion from various sources might do much to influence any announcement.

It will be recalled that E.S.M.A. has approached the Ministry (see our July 10 issue) with the same object in view but we understand that apart from an acknowledgement of their request no answer has yet been given.

Ready-made Cornices for Lighting Scheme

BANKS are invariably to be found in buildings built many years ago, which have more intricate architectural designs than the simpler lines of modern offices. Often the ceilings have been so constructed that the illuminating engineer embarking on a new lighting scheme finds a ready-made cornice suggesting an obvious installation. Such was the case at the Isle of Man Bank where translucent cornice lighting, forming a square at the base of a large dome, is the main feature of the general office illumination.

Sixteen 8-ft. fluorescent lamps, together with auxiliary gear, have been mounted in continuous strips along the four sides of the dome, and supplementary lighting has been provided by five single-lamp fluorescent reflector fittings and two twin-lamp units. The resultant level of illumination is between 10 and 12 lumens per sq ft. The scheme was planned and fittings supplied by British Thomson-Houston Co., Ltd., and the installation carried out by J. H. Cubbon Ltd., of Douglas.

New cornice lighting scheme in Isle of Man Bank

Safe Footwear for Industry

THE B.S.I. has just issued a new specification (B.S.1870) on Men's Safety Boots and Shoes, intended for application in heavy engineering industries. At a Press conference and demonstration last week given by Mr. H. Watkinson, Parliamentary Secretary to the Ministry of Labour, details of the specification's intention were given—its main function being part of an ambition to reduce foot accidents in industry. Accidents of this kind were said to cost the nation some £1½ million annually. Many types of shoe sold hitherto as protective have failed to achieve the purpose. The new guarantee will enable purchasers to recognise effectiveness, and, it is hoped, stimulate interest in the procurement of safe footwear.

Engineering Photos at R.P.S. Display

MANY pictures of technical interest to the engineer are included in the 97th Annual exhibition of the Royal Photographic Society which is open at 16 Princes Gate, London, until Oct. 12. A selection of interior photographs by E. Hyman include bromide prints showing the Festival Hall foyer ceiling and auditorium, the re-built Free Trade Hall at Manchester, and two showroom interiors. The interior of the Festival Hall has proved an attraction for two other exhibitors, and all present an excellent survey of the lighting installation.

W. A. Fleet strikes a fundamental note with his bromide print of Battersea power station which is featured again in a colour print by the Carbro method by B. A. Daglish.

Of greater technical interest are two prints in the scientific section. The first, showing the effect of a power-arc on a glass insulator, by E. A. Phoenix is exhibited by permission of the Director, B.E.A. Laboratories and the second by P. H. Harris, an electron micrograph of tunnels in aluminium. This was shown by courtesy of B.I.C.C. and British Dielectric Research.

CONFERENCE ON SMOKE ABATEMENT

THEME of this year's conference of the National Smoke Abatement Society will be the decrease of Britain's productivity in coal smoke. The conference is to be held at Portsmouth between September 24 and 26. What is termed as new evidence on air pollution and cancer of the lung is to be given by Dr. Percy Stokes, Senior Research Fellow of the British Empire Cancer Campaign. This year's Des Voeux Memorial Lecture will be given by W. R. Hornby Street on "Smoke and the Law."

Fish Lift for H. E. Schemes

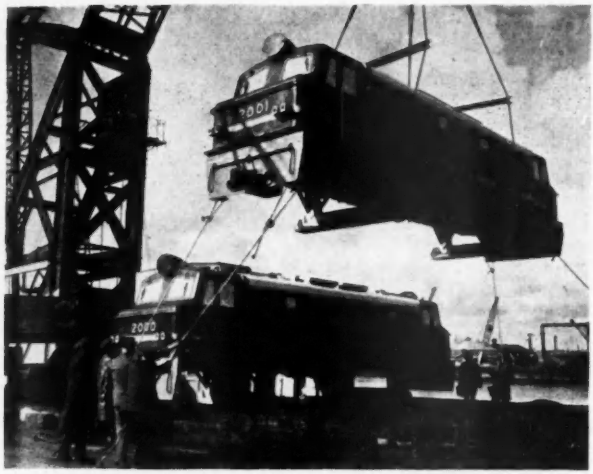
A NEW and simplified type of salmon lift has been adopted by the N. of Scotland H.-E. Board. The system was invented by Mr. J. H. T. Borland, costs a sixth of earlier types and has proved successful in Ireland. It is to be incorporated in the Torr-Achilty and Loch Shin schemes and at the Invergarry dam. The basis of the lift is that salmon enter, attracted by the flow, gates are closed and the lift flooded, carrying the fish to the top and so out to the dam; the lower gate is then opened, water released and the process restarted. Hydro-electric dam designers in the U.S., Canada, Tasmania, New Zealand and France are understood to be interested in the development.

ELLIOTT BROS. SALES CONFERENCE

TO enable the company's provincial and other outside technical sales staffs to become acquainted with the latest developments of the range of products, a sales conference has been held at the Century Works of Elliott Brothers (London), Ltd. The conference included lectures by engineering, production and sales executives, and visits to the Lewisham and Rochester production shops, and the Research Laboratories at Borehamwood. On Thursday evening last, the serious business was put aside for a while, when an informal dinner was held at Oddenino's, with Mr. L. Bagrit, managing director, in the chair, supported by Dr. L. L. Ross, general manager, and Mr. E. O. Herzfeld, secretary. Completing an enjoyable evening, the party later saw "London Laughs" at the Adelphi Theatre.

E.I.B.A. Golf Finals

AS previously announced the E.I.B.A. Golf Championship Final will be held at Worthing Golf Club on October 13 and 14. Play for the Sir Montague Hughman Trophy and for the Veterans Trophy will be on the morning of October 13. The Foursomes Competition will take place in the afternoon and the dinner in the evening. All Tuesday will be devoted to the Medal Competition for the Visitors' Rose Bowl. Full details may be had from W. J. Bird, Magnet House, Kingsway, W.C.2.



The first two of ten 1,072 h.p. 3,000 V d.c. electric locomotives made by Metropolitan-Vickers for Rede de Viacao Parana-Santa Catarina, Brazil, being loaded at Liverpool docks for shipment to S. America. They are 50-ton four-axle locos designed for mixed traffic

NEWS IN BRIEF

Showroom leaflet designed to popularise electric cooking and Sunvic Products particularly has been produced by Sunvic Controls, Ltd. Supplies available for distribution by contractors and in Electricity Board showrooms.

Staff of Dorman and Smith, Ltd., held their first sports and gala day at the Crescent Athletic Ground, Salford, recently.

Collection made by employees of Telegraph Construction and Maintenance Co. Ltd., for victims of the Lynmouth floods, realised £75.

The E.I.B.A. Ball is to be held at Grosvenor House, Park Lane, W.1., on Friday, November 14. Tickets, price 2½ guineas each, which includes dinner, are obtainable from the association.

A 100 m.p.h. wind tunnel is to be built by British Railways at Derby. It will be used, among other things, to test draught-proof signal lamps, and the cooling of diesel locos.

Site of Whitby Urban Council's former offices in Flowergate, demolished following wartime bombing, is being sold to North-Eastern Electricity Board.

Numerous applications of electricity were demonstrated on this stand of the S.E. Scotland electricity Board at the Festival Autumn Show of the Royal Caledonian Horticultural Society, in Edinburgh, at the beginning of this month. Feature was the demonstration of artificial illumination on tomato seedlings. In addition there were soil warming, soil sterilising, hedge trimming and lawn mowing demonstrations

Electric Supply News . . .

Axbridge

Strong criticism of the South Western Electricity Board, was made recently when Axbridge R.D.C. decided to pay £785 for a capital contribution towards the cost of h.t. and l.t. mains and a substation to serve a housing estate at Redcliffe Street, Cheddar. The R.D.C. decided to make the payment subject to any right of appeal that might be found to exist, and that the Board's action and its effect on housing costs, be drawn to the attention of the Rural District Councils' Association, and the local M.P.

Eire

The Clonark area, between Athlone and Ballinasloe, was given its first supply of electricity recently under the rural electrification scheme of the Electricity Supply Board. Over 250 consumers in the area are being connected. At the opening ceremony, performed by Mr. Boland, Minister for Justice, he said 200,000 poles and 10,000 miles of line had been utilised and 69,000 consumers had been connected. When the entire scheme for the twenty-six counties is completed, over 800 areas will have been connected. More rapid progress was only being held up by a shortage of essential materials, it was stated.

Lancashire

After holding an inquiry earlier this year into the dispute between the Lancashire County Council and the North Western Electricity Board, over the erection of overhead lines at Marshaw, near Abbeystead, in the area of the Trough of Bowland, the Minister of Fuel and Power, after consultation with the Minister of Housing and Local Government, has decided to withhold his consent to the board's application for the sections in dispute.

Oxford

Contesting a B.E.A. proposal to erect a 132 kV overhead transmission line between Cowley and Yarnton, crossing part of Shotover, the Oxford Preservation Trust called a conference of interested parties on Monday last. Earlier this year the Trust was informed of the proposed routeing of the line which will connect the substation at Cowley with another at Yarnton. At Monday's conference it was announced that the B.E.A. had agreed not to run the line across Shotover. The Yarnton substation will now be fed by a line from the grid south of Eynsham along a route north-west of Wytham Hill, and a short connection will run from the grid to Cowley from a point north of Toot Baldon. Shotover will be by-passed.

S.E. Scotland

Out of a list of 44 schemes for rural electrification drawn up for Southern sub-area of the South East Scotland Electricity Board, the local committee of the Consultative Council has put forward a selection. The areas selected include Fountainhall, provided certain quarries are willing to take a supply; Lymewater, Stobo, Grantshouse, Crailing, and Selkirk south district. If the Fountainhall scheme was not put in hand, it was recommended that Lilliesleaf, followed by Ashkirk, should be included. It was estimated that the schemes would cost £73,100, this corresponding with the amount permitted to be spent on rural developments this year. It was further suggested that an additional £16,000 should be set aside for use in connecting up isolated farms near existing supplies. The Consultative Council has endorsed these recommendations and passed them to the Board for consideration.

Tredegar

In regard to an agreement for underground mains to new housing sites, the South Wales Electricity Board has notified the U.D.C. that they would lay mains provided they were allowed to install in each house an adequate number of power points, a separate and complete electric cooker circuit, immersion heaters (or to arrange for each water storage tank to be fitted with a suitable boss to permit the installation of an immersion heater) and a power point close to the tank. After a member had questioned the wisdom of allowing an external authority to impose such conditions, it was decided that the surveyor, clerk and the chairman should take the matter up with the district commercial officer of the Board.

Wallasey

The Town Planning Committee has received an assurance from the B.E.A. that the additional 120 ft steel chimney required at the Limekiln Lane generating station will be used in connection with an oil-fired boiler, to be used for short periods only during peak periods, and the emission of grit should be negligible.

LIGHTING SCHEMES

Bristol.—The Docks Committee has approved a scheme for improved lighting at the Royal Edward Dock oil basin, Avonmouth. The quayside lighting is to be replaced with a tungsten installation, and 60 sodium vapour lamps on concrete columns are also to be erected. Work is to be carried out under the direction of Mr. N. A. Matheson, engineer-in-chief, of the Port of Bristol Authority.

Chorley.—The T.C. propose to convert lighting in Eaves Lane from gas to electricity, at a cost of £2,000.

Haslington.—Parish Council is seeking approval of a £1,500 loan for street lighting improvement.

Stamford.—T.C. to convert from gas to electricity street lighting in Conduit Road, Emlyns Street, Recreation Ground Road, Kings Road, New Cross Road, Sussex Road and Cliff Road, in addition to the A.1 road through the town.

Company Activities . . .

Dorman Smith Holdings

The profit for the year to March 31 last is £84,557 (*£71,271*), and the Ordinary dividend has been raised to 4½%, as against 3% for the previous period. After charging depreciation, directors' remuneration and taxation the net profit is £23,446 (*£19,038*). The Preference dividend absorbs £5,513 (*£5,775*), and the Ordinary dividend £4,134 (*£2,756*), leaving £9,578 (*£7,644*). The chairman, Mr. T. Atherton, states that, as forecast in his statement of 1951, a member of the board visited South Africa during the year, and since its close a representative of the South African company has been called to England for consultation. These visits were too late to avoid another disappointing result, and it is feared that a further loss will be made during the current year. It is hoped, however, that in consequence of decisions now taken, the South African company will be on a profitable basis from April, 1953. At the time of writing, the year to March 31 next promises to be a good one. Orders have, however, during the past few weeks, shown a distinct tendency to fall off, and it is possible that prices will have to be reduced, he adds.

Engineering & Lighting Equipment Co.

Orders in hand are such as to maintain full production for some time ahead, Mr. S. A. Marples, chairman, stated at the meeting last Thursday. But such a high volume of orders, and the present high incidence of taxation, make severe demands on the firm's financial resources.

James Howden & Co.

A considerable increase in profits is shown in the preliminary report for the year to April 30. The total, before taxation, is £1,109,502 as compared with £579,477 for the previous year. The final Ordinary dividend is 22½%, making 30%. After all charges, including taxation, the net profit is £474,445 (*£257,458*). There is £350,000 (*£161,585*) placed to general reserve, £30,000 (*same*) to employees' pensions, etc., and £56,711 (*£48,259*) carried forward.

Palestine Electric Corporation

Despite the severe operational activities last year, the units sold (532,000,000) were 20% above the 1950 figure. Gross revenue increased by about the same amount but operating costs were 33% higher than the previous year, the Rt. Hon. Viscount Samuel, chairman, states. Revised charges came into force only in October 1951. Considerable progress has been made on the extensive constructional work at Reading power station to house two 50MW turbo-generators ordered from the U.S.A. The increasing demand in Israel necessitates further large extension of the corporation's generating capacity and distribution network in the near future. The shortage of foreign currency, coupled with severe financial restrictions, have created conditions unfavourable to the raising of capital at the present time. Discussions have taken place with the Government of Israel and a visit was made to the U.S. to examine the possibilities of obtaining capital.

Power Corporation of Canada Ltd.

For the year ended June 30 last, the net profit is $1,857,027 ($1,649,495). Dividends paid on Common share totalled $1·60 per share (*$1·30*). The surplus is increased to $4,477,532 (*$4,042,598*).

Saunders Valve Company

Group profit for the year to April 30 last is £211,114 compared with £148,721 for the previous year. The final dividend is 12% (*10%*), making 18% (*16%*). After charging taxation of £132,302 (*£83,078*) the available profit is £78,812 (*£65,643*).

Strand Electric Holdings

The consolidated net profit for the year to April 30 last, before taxation is £51,212 (*£45,234*). After charging taxation the figure is £24,407 (*£21,912*). The dividend is again 17½%.

Tangyes Ltd.

The subscription list opens tomorrow, September 19, for the issue of £300,000 5½% First Mortgage debenture stock 1962-72 at £99. Net proceeds of the issue, estimated at £285,500, will be applied in paying off borrowings from the company's bankers, any balance being used for working capital.

Telephone Manufacturing Co.

In an issue of new capital, shareholders are to be offered 1,000,000 5/- Ordinary shares at a price of 5/9d. each, on the basis of one for every two held, we learn. This issue will raise £287,500.

Dividends Declared

Albright and Wilson.—Interim of 5% (*same*) payable on September 30.

Associated Electrical Industries Ltd.—Interim dividend of 7½% on £8,870,596 Ordinary capital payable on October 16. Last year there was an interim of 7½% on £6,000,000 capital and final 12½% on £6,652,947 capital.

British Oxygen Co.—Interim of 6% (*8%*) on enlarged capital.

Herbert Terry and Sons.—Interim of 5% (*same*) payable on September 26.

International Telephone and Telegraph Corpn.—Interim of 20 cents.

C. A. Parsons and Co.—Interim of 5% on £1,200,000 capital. For the previous year there was an interim of 7½% on £600,000 capital and final of 6¼% on the £1,200,000.

A. Reyrolle and Co.—The interim is 5% (7½%) but on capital doubled by 100% scrip bonus.

Walsall Conduits Ltd.—Interim of 20% (*same*) but on increased capital, payable on October 1.

Watford Electric and Manfg. Co.—Interim of 5% (*same*).

Commercial Information

CONTRACTS OPEN

HOME

Sept. 19.—Aberdeen. Electrical work in erection of school at Aboyne. Geo. Bennett Mitchell and Son, Architects, 1 West Craibstone St., Bon-Accord Sq.

Sept. 19.—Glasgow. Electrical work at Mitchell Library in North St. Names by above date to City Engineer, Office of Public Works, City Chambers, Glasgow, C.2.

Sept. 19.—Manchester. Alterations and additions to electrical installation at New Moston junior school. City Architect, Town Hall. Deposit £1 1s.

Sept. 19.—Neston U.D.C. Supply and erection of 32 electric lighting columns (height 25 ft, for fluorescent and sodium lamps, together with all necessary control gear and fuses. Engineer and Surveyor, Town Hall, Neston). Deposit £1 1s.

Sept. 19.—Northern Ireland. Complete electrical installation at fire station in Valentia Place, Newcastle. Kirk and McClure, Civil Engineers and Surveyors, 19 Adelaide St., Belfast.

Sept. 22.—Berwickshire C.C. Electrical work in 7 houses at Lower Burnmouth. County Surveyor, Duns.

Sept. 22.—Haverfordwest T.C. Installation of electric light and power in about 143 houses in scheme No. 2. Borough Surveyor, 9 Victoria Place. Deposit £2.

Sept. 22.—Newcastle-on-Tyne. Electrical installation in Blakelaw control centre for C.D. committee. P. Parr, city engineer, Town Hall.

Sept. 22.—Nottingham Education Committee. Stage 1 of the re-wiring of the Nottingham and district Technical College. Shakespeare St., Nottingham, including mains, switchgear and final circuit wiring for complete new lighting and power schemes, including the supply and erection of all lighting fittings. Particulars from consulting engineers, E. G. Phillips, Son and Norfolk, Arskus House, Annesley Grove, Nottingham. Deposit £2. (See September 4 issue.)

Sept. 23.—Sunderland T.C. Electrical installation in 549 houses at Thorney Close, Pennywell, Hylton Red House, and Castletown estates. Borough Architect, Stockton Rd. Deposit £2 2s.

Sept. 24.—Newcastle-on-Tyne. Electrical installation in 120 flats and maisonettes on Hindhaugh St. site. City Architect, 18 Cloth Market, Newcastle.

Sept. 24.—Tyrone. Electric lighting and heating installation at new Carnteel primary school. A. Gibson, Chief Education Officer, Education Offices, Omagh.

Sept. 25.—Londonderry T.C. Electrical installation in two blocks of shops (with flats) on Creggan estate. Housing Architect, 5 Guildhall St. Deposit £3.

Sept. 26.—Castle Ward R.D.C. Electrical installation in 100 houses at Ponteland. G. E. Dimmack, Engineer and Surveyor, North Rd., Ponteland. Deposit £2 2s.

Sept. 26.—Easthampstead (Berks) R.D.C. Installation of wiring and fittings in six houses at Winkfield. Engineer and Surveyor, Council Offices, Church Rd., Bracknell. Deposit £1 1s.

Sept. 26.—Glendale R.D.C. Supply of electric cookers for 43 houses. J. Baston, Clerk of the Council, Council Offices, Wooler.

Sept. 27.—Barry T.C. Installation of street lighting to Group A standard along 3¼ miles of roads in the borough. Schemes are to be submitted for the complete works of dismantling existing lighting installations, supply and erection of columns and fittings and electrical connections to mains. Borough Engineer and Surveyor, Town Hall, Tynewydd Rd., Barry.

Sept. 27.—Lanark. Electrical work in erection of secondary school at East Kilbride. Applications by above date to Wm. C. Brownlie, County Clerk, Lanarkshire House, 91 Ingram St., Glasgow.

Sept. 27.—Wisbech (Ely) R.D.C. Wiring of 12 houses at Ring's End. T. A. C. March, housing surveyor, Council Offices, Alexandra Road.

Sept. 29.—West Riding. Renewal of electrical installation at Harrogate School of Art. County Architect, "Bishopgarth," Westfield Rd., Wakefield. Deposit £2 2s.

Oct. 1.—Dalkeith T.C. Electrical work in 80 houses at Woodburn. Particulars from the Surveyors, Morham and Brotchie, 29 Hanover St., Edinburgh.

Oct. 3.—Brockhall (Lancs). Hospital Committee requires supply of electric lamps for year beginning Nov. 1. Secretary is M. Lawrence, Brockhall Hospital, Langho, nr. Blackburn.

Oct. 3.—Manchester. Provision of sundry electrical engineering equipment in connection with extension to Municipal College of Technology. Details from Acting Principal, College of Technology. (See September 11 issue.)

Oct. 3.—Manchester. Supply of various X-ray equipment for fuel research laboratory in extension to College of Technology. Particulars from acting Principal of College, Manchester 1. (Advertised in this issue.)

Oct. 3.—Portsmouth T.C. Supply and installation of an electrically operated air conditioning and gas filtration plant at the civil defence main control, Fort Widley. City Engineer, Council Chambers, 1 Clarence Parade, Portsmouth. Deposit £2 2s.

Oct. 4.—Saddleworth U.D.C. Installation of 140 W sodium lighting on A670 road from Oldham to Standedge. G. H. Booth, Lighting Superintendent, Council Offices, Uppermill, nr. Oldham.

Oct. 6.—Whitley Bay U.D.C. Supply and erection of 22 sodium street lighting units with concrete columns along Earsdon and Seatonville Roads. Surveyor is E. Roberts, Council Offices. Deposit £2 2s.

Oct. 8.—Goole T.C. Vertical spindle centrifugal pump, 75,000 gal/hr. against static head of 210 ft, with electric motor, for Pollington Waterworks. Silcock and Simpson, Consulting Engineers, 10 Park Row, Leeds. Deposit £5.

Oct. 8.—Northern Ireland. Electrical installation in R.U.C. county station, Galgorm Rd., Ballymena. Documents from

Ministry of Finance (Room 103), Law Courts Building, May St., Belfast.

Oct. 14.—Cork. Electrical installation at the Southern Regional Sanatorium, Sarsfields Court, Glanmire, now under construction for the Department of Public Health, to house 344 patients. Work comprises 220/380 V installation for lighting, heating, cooking, sterilising, water heating, etc., and low voltage installation 12-100 V for nurses' call systems, telephones, radio and p.a. remote control, clocks, etc., and the supply and fixing of specified equipment, appliances and fittings. P. O. Cinneide, secretary, Department of Public Health, Custom House, Dublin. Deposit £20.

Oct. 14.—Grimsby T.C. Electrical installation at new secondary school for boys in Chelmsford Ave. J. V. Oldfield, Borough Engineer and Surveyor, Municipal Offices, Town Hall Square. Deposit £5.

Oct. 20.—Diss (Norfolk) U.D.C. Supply of five sets of electrically driven vertical unchokeable pumps, screens, etc., for drainage scheme. Engineers are John Taylor and Sons, Artillery House, Artillery Row, Victoria St., Westminster. Deposit £5.

No date stated.—Aberdeen. Electrical work in erection of infant school at Cummings Park. J. A. O. Allan, Ross and Allan, Architects, 10 Bon-Accord Sq.

No date stated.—Sedgley U.D.C. Provision and erection of 23 concrete columns with 250 W mercury lighting equipment and accessories for Bilston St. and George Rd. Documents from W. M. Jones, Engineer and Surveyor, The Limes, Dudley Rd., before Sept. 27.

OVERSEAS

Details of items marked * *may be obtained on application to the Board of Trade, Horseguards Avenue, S.W.1, quoting reference.*

Oct. 11.—Formosa. Supply of three oil-immersed, self-cooling transformers—one 3,300 V 3-phase 60 c/s primary, to 440/220 V, 30 kVA cap., and two 3,300 V single-phase to 220/110 V 20 kV cap. Central Trust of China, 96 Po Ai Rd., Taipei, Taiwan. B.o.T. (Ref. CRE 30445/52).*

Oct. 13.—New Zealand. G.P.O. requires rotary convertors, input 12 V d.c., output 230 V, 100 W, 50 c/s single-phase, and spares. Tenders to Director-General at Wellington. B.o.T. (Ref. CRE 30990/52).*

Oct. 14.—Formosa. Supply of 4 sets of geared motors for belt conveyors for Central Trust of China. Trust (U.S. Aid Div.), is at 96 Po Ai Rd., Taipei, Taiwan. B.o.T. (Ref. CRE 30379/52).*

Oct. 14.—Uruguay. Supply of 300,000 metres of copper conductor, black vulcanised insulation for open air. Usinas Electricas y Telefonos del Estado. B.o.T. (Ref. CRE 30203/52).*

Oct. 15.—Uruguay. Supply of 14,300 metres of lead covered conductors for normal tension of 200 V. Usinas Electricas y Telefonos del Estado. B.o.T. (Ref. CRE 30222/52).*

Oct. 20.—Formosa. Diesel electric generator unit (generator: 100 kVA, 440/220 V, 3-phase, 60 c/s, 900 r.p.m.) required by Mutual Security Agency. B.o.T. (Ref. CRE 30454/52).*

Oct. 20.—Formosa. Central Trust of China invites tenders for centrifugal type water pump with electrical induction motor, 220 V, 3-phase, 60 c/s, 1,750 r.p.m., 5 h.p., with mag-starter push-button control. B.o.T. (Ref. CRE 30430/52).*

Oct. 21.—Uruguay. Supply of power transformers and spare equipment required by Usinas Electricas y Telefonos del Estado, Montevideo. B.o.T. (Ref. CRE 30813/52).*

Oct. 23.—Australia. Supply of 2,000 type switch maintenance parts for Director, Posts and Telegraphs, Melbourne C.1. B.o.T. (Ref. CRE 30038/52).*

Nov. 14.—Northern Rhodesia. 11 kV and l.t. cables, switchgear and transformers for Northern Rhodesia Government. Details from consulting engineer, P.O. Box 4648, Johannesburg. Deposit £3 3s.

Oct. 28.—New Zealand. Supply of considerable quantities of valves, cathode-ray tubes, and photo-electric cells, for Director - General (Stores Div.), G.P.O., Wellington. B.o.T. (Ref. CRE 30753/52).*

Oct. 29.—Uruguay. Supply of echo sounding equipment for fishing use suitable for 50, 100, 150 and 200 fathoms, required by Servicio Oceanografico y de Pesca. B.o.T. (Ref. CRE 30747/52).*

Nov. 14.—N. Rhodesia. Supply and installation of 11 kV and l.v. cables, switchgear and transformers to various specifications. Documents from Consulting Engineer, P.O. Box 4648, Johannesburg, on payment of £3 3s.

No date stated.—Uruguay. Supply of up to 30,000 ft thickly covered iron electrodes for arc welding work on train rails. Machines to be used are d.c. 150-250 A, positive electrode. Administracion Municipal de Transportes Colectivos de Montevideo. B.o.T. (Ref. CRE 30814/52).*

Your Queries — Answered

"Desmos-Vitos" hosiery repairing machines, suppliers of? L.L.—B. Toone (Nottingham) Ltd., Newdigate St., Nottingham. (23918)

"Picador" pulleys, suppliers of? E.S.—H. K. Staub, 59 Farringdon St., E.C.1. (23927)

"Co-Elec" fires, makers of? E.C.—Jeffrey Tiles Ltd., Barr's Court Rd., Hereford. (23934)

"Maglow" fires, makers of? T.E.—Mabro and Co. Ltd., 113 Fetter Lane, N.W.1. (23939)

"Colombo" toasters, makers of? L.E.—These were made by a Kingston firm, Colombo Products Ltd., of whom there has been no trace since 1950. (23947)

"Three Triangles" dies, makers of? A.W.—British Tap and Die Co. Ltd., Town Rd., Edmonton, N.9. (23952)

"Vereston" vacuum cleaners, suppliers of? H.P.—Debenhams Ltd., 91 Wimpole St., W.1. (23958)

"Venor" cloth cutting machines, makers of? H.L.—D. Simcock and Co. Ltd., 125 Oxford Rd., Manchester 1. (23965)

The above are selected from questions we have answered this week. If you have a query, send it to us.

CONTRACTS PLACED

Durham. Electrical installation in Byers Green mixed and infants' school, F. E. White, £957; same in Jarrow Central school, Dougal and Railton £2,552.

Keynsham U.D.C. Electrical installation in 48 houses on Park Rd. estate, Harvey and Co.

London. Electrical installation at Earl Rise primary school, Thorpe and Thorpe Ltd.; and same at Ashmale primary school, E. Satterthwaite Ltd. Installation of passenger lift at Central School of Arts and Crafts, McGhee and Murray Ltd., £2,500.

Mansfield T.C. Electrical work at General Hospital, N. G. Bailey and Co. Ltd., £4,534.

Newbiggin (Northumb.) U.D.C. Electrical work for 50 houses on Spital estate, J. B. Wilson.

Newcastle-on-Tyne. Supply of 239 cast-iron street lighting columns and swan neck brackets, Revo Electric Co., Ltd., £2,629.

Salford. Lighting installation at Seedley Baths, N. Western Electricity Board, £1,510.

Sheffield. Staff location system at City General Hospital, Standard Telephones and Cables, Ltd., £1,550.

PRICE OF CABLE METALS AND OTHER MATERIALS
(at Tuesday night)

	£ s. d.	New York price
COPPER, electrolytic	285 0 0	—
LEAD, good soft pig (foreign)	131 0 0	£128 0 0
" " " "English" quality ...	132 10 0	
TIN (99·99·76%) ... ... (Cash)	960-962	—
" (3 months)	952-953	—
ALUMINIUM, commercial purity (del.)	157 0 0	—
ZINC	126 0 0	116 0 0
ARMOURING:		
Galv. Steel Wire (0·104 in.) ...	54 0 0	—
Mild Steel Tape (0·04 in.)	39 15 0	—

GAZETTE ANNOUNCEMENTS

COMPANIES ACTS

Brow Plating and Electrical Co. Ltd. Resolution for voluntary winding-up passed at meeting on September 5, when Reginald Russam, Manor Buildings, 2 Manor Row, Bradford, appointed liquidator.

M. C. Brown Ltd. Resolution for voluntary winding-up passed at meeting on September 4, when Henry Charters Allen, C.A., 211 Lower Addiscombe Rd., Croydon, Surrey, was appointed liquidator.

John Raymond (Electrical) Ltd. of Cheltenham. Last day for receiving proofs in respect of payments to preferential creditors. Liquidator is G. W. Sisman, Official Receiver, 26 Baldwin Street, Bristol.

Simmonds and Stokes Ltd. Meeting of members will take place at offices of Moore, Stephens and Co., 30 Cornhill, London, E.C.3, on October 17 at 12 noon to receive liquidator's report. (This notice relates to the old company and not the present concern.)

Voluntary Liquidation

Infrasafe Ltd., infra-red process engineers, of Leicester. At meeting of creditors it was reported that company was incorporated in July, 1951, with nominal capital of £5,000, increased last Oct. to £10,000, of which £4,800 had been issued. Statement of affairs showed liabilities of £7,331, of which £5,947 was due to trade creditors and £1,383 to cash creditors. Assets estimated to realise £2,736 and after deducting £203 for preferential claims, there were net assets of £2,533, or deficiency as regarded creditors of £4,798. Total deficiency so far as shareholders were concerned was £9,598. Resolution passed confirming voluntary liquidation with R. A. Haigh, C.A., Friar Lane, Leicester, as liquidator, with a committee of inspection.

BANKRUPTCY ACTS

First Meeting

Birmingham. Alfred S. Lines, electrician, of 126 Cropthorne Road, Solihull. First meeting at Official Receiver's office, Somerset House, 37 Temple Street, Birmingham, on September 19 at 11.15 a.m. Public examination at Court House, Corporation Street, on November 12 at 10.45 a.m.

Receiving Order

Birmingham. Alfred S. Lines, electrician of 126 Cropthorne Rd., Solihull. Date of receiving order, September 3.

TRADE MARKS

This information is extracted from the Official Journal by permission of the Controller.

ER in monogram B705,195. Class 9. Electrical resistances; and condensers, suppressors, potentiometers and volume controls, all being electrical apparatus. Erie Resistor Ltd., 2 Carlisle Rd., The Hyde, Hendon, N.W.9.

Marconi with design. 686,989. Class 9. Wireless telegraphic transmitting apparatus, etc. Marconi's Wireless Telegraph Co., Ltd., Electra House, Victoria Embankment, W.C.2.

Norman, with design 107,298. Class 9. Resistances, fuses, transformers, chokes, etc. Norman Rose (Electrical) Ltd., 53 Hampstead Rd., N.W.1.

Serviseal. 708,123. Class 7. Compressors and electric motors for refrigerators. 708,124. Class 11. Condensing units for refrigerators. Marco Refrigerators Ltd., Manor Works, Rowan Rd., S.W.16.

Servitel. 707,290. Class 9. Radio, television and electronic apparatus. Servitel Television Ltd., 72 King St., Stretford, Manchester.

Sew-Tric. 707,652. Class 7. Electric motors, sewing machines and parts and fittings. Sew-Tric Ltd., Sew-Tric House, Honeypot Lane, Stanmore, Middx.

Spinney in design. 707,745. Class 9. Domestic electric cleaning apparatus, etc. Littlewoods Mail Order Stores, Ltd., Waterloo Buildings, Cases St., Liverpool 1.

Teleflex. 690,483. Class 9. Parts of apparatus and instruments adapted for operation by cables actuated remote control mechanisms, electrically operated window and door opening and closing devices, etc., 690,485. Class 11. Parts of installations for lighting, heating, steam generating, cooking, etc. Teleflex Products Ltd., 9 Cavendish Sq. London, W.1.

BUSINESS PROSPECTS

HOME

Aberdeen. Approval granted for erection of church at Mastrick for Congregational Authorities.

Ayr. Dean of Guild Court has approved factory extensions of William C. Gray and Sons, Ltd., Newton Carpet Works.

Bexhill T.C. Planning Committee has approved development of Little Common housing estate.

Billericay. Secondary school is to be built at Nevedon.

Boldon (Dur.) U.D.C. Plans approved for 74 houses on Wellands Lane site, Whitham.

Brentford and Chiswick T.C. Erection of 42 flats in Hogarth Lane, Chiswick. Borough Engineer and Surveyor, Town Hall, Chiswick, W.4.

Bridgnorth (Salop) R.D.C. Plans in advance stage for erection of 100-130 houses at Highley, 20 at Ditton Priors and 36 on four other sites. Also, it is proposed to build 50 houses at Claverlay and 34 on another four sites.

Bromsgrove U.D.C. Erection of 70 houses on Charford Estate. Engineer and Surveyor, Council House.

Cannock (Staffs) R.D.C. Erection of 27 houses on Brownshore Lane site. Council's Architects, Gray and Ballinger, Bridge St., Walsall.

Carlow (Eire). Erection of 69 houses at Tullow and 64 at Muineleag for C.C. Secretary, C.C. Offices, Court Place, Carlow.

Chelmsford. Approval given for erection of church hall. Architects are O'Neill and Fordham, 65 Springfield Road.

Chorley Wood (Herts) U.D.C. Plans approved for construction of 84 houses on Berry Lane site.

Clay Cross (Derby) U.D.C. Plans approved for 210 miners' homes, 94 other houses and private estate of 20 houses.

Coatbridge (Lanark). R.C. church is to be built at Townhead for Motherwell Diocese. Scheme has been approved.

Coventry. Application to be made for sanction to borrow £183,952 for erection of 90 houses and 30 flats on Bell Green Neighbourhood Unit; £45,920 for 32 houses at Stoke Aldermoor and a further amount for 31 houses on same site.

Cumberland. Building programme for next year includes Cleator Moor R.C. secondary school and Maryport secondary school.

Deben (Suff.) R.D.C. Twelve houses each to be built at Witnesham and Bucklesham, six each at Hasketon and Alderton, and 18 at Rushmere.

East Kilbride. Development Corp. has approved erection of 60,000 sq ft factory for Hayward-Tyler and Co. Ltd.

Gillingham T.C. Construction of Featherby Junior School in Chilham Rd. Borough Engineer's Dept., Municipal Buildings.

Goole (Yorks) R.D.C. Approval given for erection of further 83 houses in rural areas. Largest of 11 groups is 16 houses at Snaith.

Grangemouth T.C. Dean of Guild Court has approved erection of 102 houses at Beancross at estimated cost of £156,000.

Halifax. £39,650 is to be spent on Ling Bob infants' school.

Hartlepool T.C. About 90 houses to be built on Nicholson's Field.

Heanor (Derby) U.D.C. Erection of 40 houses at Aldercar. R. Archer, engineer and surveyor, Council Offices.

Howden (Yorks) R.D.C. Further 50 houses to be built on Scuttlecroft Lane estate.

Inverness T.C. Dean of Guild Court has approved plans for erection of three blocks of three-storey flats (45) at Dalneigh.

Isle of Axholme R.D.C. Twenty-two houses to be built at Crowle, 5 at Belton and 11 at Epworth.

Larne (Antrim) T.C. Permission granted to borrow £391,000 for 244 houses in Old Glenarm Rd. First stage comprises 52 houses.

Llanrwst U.D.C. Construction of 20 houses on Tyddyn Fadog site. Clerk of Council, Plas-yndre, Llanrwst.

Malling (Kent) R.D.C. Erection of 28 houses and 20 flats at Clare Park. Applications to Council Offices, West Malling.

Newcastle-on-Tyne. Erection of 18 flats and 15 houses on Montagu estate. City Architect, 18 Cloth Market.

Newcastle-on-Tyne. Sanction to borrow £25,102 has been received for installation of electricity in 949 council houses.

Northern Ireland. Housing Trust to build 24 houses at Kilrea, Londonderry. Trust is at 12 Hope St., Belfast.

Paisley T.C. Dean of Guild Court has approved building of 60 dwellings at Hunterhill.

Scunthorpe. Plans, by County Architect, in hand for £200,000 New Westcliff School.

Stockport T.C. Erection of 48 flats in Covent Garden area. Wm. F. Gardner, Borough Surveyor, Town Hall.

Stroud U.D.C. Construction of 20 houses at Cashes Green. F. Foster Langley, engineer and surveyor, Council Chambers.

Swindon T.C. Arrangements made for overhaul of lighting at Museum.

Teignmouth. Rebuilding of Teignmouth Hospital is to start at once. Project is estimated to cost £67,390.

Thornaby-on-Tees T.C. Plans in hand for £9,625 scheme for installing electricity in 250 houses in Northumberland Rd. area. Borough Engineer is P. Brown, Town Hall.

Tottenham B.C. Erection of 51 flats on Tewkesbury estate. Borough Engineer and Surveyor, Town Hall, N.15.

Uttoxeter U.D.C. Erection of 62 houses on Copes Parks estate. Architect, Old Bank House Annexe, High Street.

Wakefield. Approval received for first instalment of rebuilding Thornes House grammar school. Total estimated cost, £178,000.

Wallsend T.C. Erection of 36 flats on Oak Grove estate. Borough Surveyor, Town Hall.

West Denton (Northumberland). P. L. Browne, Son, and Harding, Pearl Buildings, Newcastle-on-Tyne, are the architects for a proposed new church.

Whitworth U.D.C. Erection of 40 houses on Wallbank Estate. Architects, A. Brocklebank and Co., Martins Bank Chambers, Waterfoot.

Wigan. The R.D.C. has approved plans for quarry buildings at North Quarry, for Appley Bridge Quarries, Ltd.

Wokingham (Berks) T.C. Construction of 86 dwellings on Norreys Barn estate. Eric G. V. Hives, architect, 3 Cork St., Reading.

York. Erection of 72 flats on Askham Lane estate, and 4 bungalows and 2 houses in Danebury Court. E. Firth, City Architect, Guildhall.

Business Prospects—continued

OVERSEAS

Canada. Mr. W. H. Morrison, merchandise manager of the Marshall-Wells Canadian Co.'s Executive Offices, Winnipeg, is seeking new sources of supply of a wide range of goods and would like to receive catalogues etc., from U.K. manufacturers of electrical appliances, radios and refrigerators.

U.S.A. Quotations sought by International Export Co., 431 Carondelet St., New Orleans, of hard or annealed, weather proof, double braided, insulated copper electrical conductor wire in sizes 0·204, 0·162, 0·128 and 0·102 in., and hard or annealed wire in sizes 0·204, 0·162, 0·128, 0·102 and 0·081 in. Offers to Mr. Jose Ortiz, stating quantity available up to 50,000 lb of each.

U.S.A. The Square D Co. of Detroit, Michigan, are interested in licensing manufacture of its electronic control and distribution equipment; Bush Manufacturing Co. of West Hartford, Connecticut, would like to license European production of their refrigeration, air conditioning and heating products; and Ultra-Cold Inc., of Los Angeles, is interested in licensing the European manufacture of its refrigeration equipment.

MEETINGS TO NOTE

TUESDAY, SEPT. 23

A.S.E.E. (York Branch). Film lecture on "A Concrete Proposition" by repr. of Ductube. Creamery Restaurant, Pavement, 7.30 p.m.

ENGINEERS' GUILD (W. Midland Branch).—Annual meeting and film show at Imperial Hotel, Birmingyam, 6.45 p.m.

WEDNESDAY, SEPT. 24

INSTN. OF LOCOMOTIVE ENGRS. Presidential address, "Motive Power for Railways," by C. M. Cock. Inst. of Mech. Engrs., Storey's Gate, S.W.1, 5.30 p.m.

BRITISH INSTN. OF RADIO ENGRS. (W. Midlands Section). "Pulse Tester for Coaxial Cables." N. S. Dean and E. Carey. Wolverhampton Technical College, Wulfruna St., 7.15 p.m.

BRITISH KINEMATOGRAPH SOC. Symposium on "TV Advances in Film Industry." A. M. Spooner, G. C. Newton, R. Toombs, and C. Vinten. Film House, Wardour St., W.1., 7.15 p.m.

INSTN. OF HEATING AND VENTILATING ENGRS. (Birmingham Branch). "Radiant Heating." F. R. L. White. Imperial Hotel, 6.30 p.m.

INSTN. OF HEATING AND VENTILATING ENGRS. (Yorks. Branch). General meeting followed by film show, etc. Hotel Metropole, Leeds, 7.30 p.m.

NAT. SMOKE ABATEMENT SOC.—Nineteenth annual conference opens today at Portsmouth. Closes on Fri.

THURSDAY, SEPT. 25

I.E.S. (Nottingham Centre). Annual luncheon and induction of chairman. Victoria Hotel.

INST. OF WELDING (N. London Branch). "Welding in America." F. Clark, H. E. Lardge, and S. M. Reisser. Regent St. Polytechnic.

FRIDAY, SEPT. 26

I.E.S. (Leeds Centre). Annual dinner and induction of chairman. Visit of President. Guildford Hotel, The Headrow.

INCORP. PLANT ENGRS. (Birmingham Branch). "Modern Factory Lighting." F. Jamieson. Imperial Hotel, 7.30 p.m.

MONDAY, SEPT. 29

I. E. S. (Leicester Branch) "Horticultural Lighting." J. J. French. E. Midlands Elect. Board, Charles St., 6.30 p.m.

TUESDAY, SEPT. 30

I.E.S. (Cardiff Centre). Chairman's address by A. J. Dalton. S. Wales Electricity Board, 5.45 p.m.

EXHIBITION DIARY

Welsh Indus. Fair. Opened last week. New Pavilion, Sophia Gdns., Cardiff. Closes **Sept. 20.**

Exbn. of Street Lighting. Held in conjunc. with A.P.L.E. annl. conf. at Harrogate, **Sept. 16** to **20.**

International Machine Tool Exbn. Opened at Olympia yesterday and closes **Oct. 4.**

N. West Business Efficiency Exbn. Opens St. George's Hall, Liverpool, **Sept. 22** until **Sept. 27.**

Internat. Comm. Motor Transport Exbn. 16th show opens Earls Court, London, **Sept. 26, closes Oct. 4.**

1952 Minibition. Org. by Purchasing Officers' Assoc. to run concurrently with their Nat. Conf. at Harrogate between **Oct. 2** and **5.**

TRADE NOTES

New Branch Office. British Driver Harris Co. have opened a new branch office at 27 Grey Street, Newcastle upon Tyne, 1, under the managership of Mr. B. S. Lockett, formerly of the head office. The new office is in a position to deal with enquiries and matters relating to the firm's alloys, including resistance materials and "Drivex" cable.

Zinc Price Up. As from September 13, the price of good ordinary brand zinc was increased by £4 to £126 per ton delivered.

Agents. Radiovisor Parent Ltd. have appointed J. Broughton and Son (Engineers) Ltd., Security Wórks, 234 Pershore Road South, King's Norton Factory Centre, Birmingham 30, sole selling agents for their photo-electric press brake guard. All other Radiovisor products are still handled by Radiovisor Parent Ltd.

Paraguay Imports. In addition to revised exchange rates Paraguay has introduced subsidies and revaluation surcharge for different categories of imports. Under Group II, for which the effective exchange rate is 58·8 guaranies to the £1, goods to which a 40% revaluation surcharge applies includes aluminium wire and bar, electric generators, porcelain and other insulators, insulated copper wire, batteries and accumulators, arc lamp carbons, insulating tape, electric tools, lamps, lanterns, and transformers. In group III, the exchange rate is £1 = gs. 84, and a 100% revaluation surcharge applies to many goods including electrical accessories, and motors of less than 3 h.p.

Change of Address. The Quicksilver Tube Manufacturing Co. has moved to Willow Road, Poyle Estate, Colnbrook, Bucks. Telephone, Colnbrook 382.

NEW COMPANIES

Extracted from the Register issued by Jordan and Sons, Ltd., 116 Chancery Lane, London W.C.2.

Peter Barker and Son Ltd. White Grange, Dunton Rd., Stewkley, Bucks. Agricultural, motor, electrical and mechanical and civil engineers, etc. Nom. cap.: £250. Permanent dirs.: P. A. E. L. Barker and H. L. Farnell.

Carolanus Ltd., Lombard House, Gt. Charles St., Birmingham 3. Manufacturers of and dealers in accessories, component parts and requisites for the automobile, mechanical and electrical engineering and aircraft trades, etc. Nom. cap.: £6,000. Dirs.: to be appointed by subs. Subs. S. Vernon Thompson and G. H. C. Stanley.

Chapman-Parker (London) Ltd. 266 Mitcham Rd., Tooting, S.W.17. To take over business of manufacturers of and dealers in electrical goods, hardware, etc., carried on at 10 Station Parade, Balham as "Chapman-

New Companies—continued

Parker." Nom. cap.: £100. Dirs. Barbara L. Burgess, A. L. Parker and S. H. Argent.

A. Console (London) Ltd., 1a Langley Lane, S.W.8. Wholesalers, retailers, manufacturers of and dealers in electrical and radio apparatus, etc. Nom. cap.: £500. Dirs.: A. Console, A. Willimott and A. F. Willimott.

Davis Bros. (Electrical) Ltd., Western Chambers, Western Rd., Romford, Essex. Nom. cap.: £500. Life dirs.: H. Davis and T. Davis.

Harrisons (Northwich) Ltd., 118 Witton St., Northwich. Electrical engineers and contractors, etc. Nom. cap.: £4,000. Dirs.: J. Harrison, K. Walker and A. Poole.

S. Maclean and Son Ltd., 127 New Bridge St., Newcastle-on-Tyne. To take over business of S. Maclean and Son carried on at Newcastle-on-Tyne; air conditioning, heating and ventilation engineers, etc. Nom. cap.: £1,000. Dirs.: S. Maclean and C. W. Hillman.

Neon Service (Wales) Ltd., 274 New Cross Rd., S.E.14. Maintainers and manufacturers of metal, electric and other signs, etc. Nom. cap.: £2,000. Dirs.: J. H. G. Pearce, C. W. Tucker and J. Scott.

Rainham Refrigeration Ltd. Refrigeration and cold-storage engineers, etc. Nom. cap.: £100. Dirs.: F. A. James, 27 Castle Drive, Ilford; L. G. Tulley, Redlands, Stafford Rd., Aveley, Essex; and W. J. H. James.

H. Woolfson and Co. Ltd., 8 Murton St., Sunderland. Consulting, advising, mechanical, electrical and general engineers, etc. Nom. cap.: £1,000. Dirs.: J. W. Cook and H. Woolfson.

ENGINEERING & LIGHTING EQUIPMENT

Mr. S. A. Marples' Statement

THE thirteenth annual general meeting of the Engineering and Lighting Equipment Company Ltd. was held on September 11 at Winchester House, Old Broad Street, London, E.C., Mr. S. A. Marples, M.I.Mech.E. (chairman of the company), presiding.

The following is the Chairman's statement which had been circulated with the report and accounts and was taken as read:—

Since I last addressed you, I am pleased to be able to report that the position of the company has further improved. The accounts for the year ended March 31, 1952, show satisfactory increases both in turnover and net profits.

The improvement in production methods, to which I referred in my statement last year, has been further accelerated during the year under review, and the improved results, which are a record in the history of your company, are reflected in the accounts before you.

You will be pleased to know that, although the increase in turnover derives partly from the important part your company is taking in the rearmament drive, the specialised engineering and lighting equipment side of our business has continued to expand in a satisfactory manner, both in the home and export markets.

Large Volume of Orders

In these times of ever-changing conditions it is difficult to forecast the future, but I am pleased to tell you that the orders in hand are such as to maintain full production for some time ahead. Since March 31, 1952, orders have continued to be received at the same high level. Such a large volume of firm orders, and the present high incidence of taxation, make demands on our financial resources, which are severe; you will find the reflection of this in our increased indebtedness to the bank.

You will no doubt wish to know the position of your company in regard to excess profits levy. You will recall that during the whole war period we suffered excess profits tax of 100 per cent.; this was based, in our case, upon what was a low standard. We are now called upon to meet an excess profits levy, based this time upon a standard covering the years after the war, during which the company, like so many others, was engaged in the difficult task of rehabilitating its business, its profits being thereby considerably reduced.

Your directors have continually under review the expansion of the company's business, and plans are in hand which I feel confident will further widen the scope of our activities.

You will, I am sure, be pleased to hear that Lord Verulam has accepted an invitation to join the Board and his appointment I am confident will be of great benefit to the company. You will be asked to confirm the appointment.

I feel that you will wish me to tender to my colleagues on the Board, the staff and workpeople, who have so willingly co-operated in attaining these results, our sincere thanks for their efforts.

Record Trading Profit

Turning to the accounts, you will see that the profit on trading for the year ended March 31, 1952, is £102,066, the highest in the history of the company, being £12,219 more than in the previous year. After providing for directors' remuneration, audit and accountancy fee, depreciation of fixed assets and taxation based on profits for the year ended March 31, 1952, there is a net profit of £33,616, which is £1,914 more than last year.

The Preference dividend for the year ended December 31, 1951, has been paid, and your directors recommend that a dividend of 10 per cent. be paid on the Ordinary shares. After charging these dividends and adjustments referable to earlier years, there are accumulated profits of £44,744 which your directors recommend be carried forward to next year.

The total current assets shown in the balance sheet of £301,406 exceed the total current liabilities of £174,577 by £126,829, which represents an improvement of £23,216 compared with the position at March 31, 1951.

I shall be pleased if the shareholders will consider and sanction the increase in directors' fees as provided in the accounts, of £100 to £250 for each director who has served throughout the year, £125 to £300 for myself as chairman.

The report and accounts were unanimously adopted and the dividend at the rate of 10 per cent. on the Ordinary shares was approved.

The director retiring by rotation, Mr. S. A. Marples, M.I.Mech.E., was re-elected, and the appointment to the Board of the Rt. Hon. the Earl of Verulam, M.A., F.I.I.A., Comp.I.E.E., J.P., was confirmed.

ROBUST

yet sensitive..

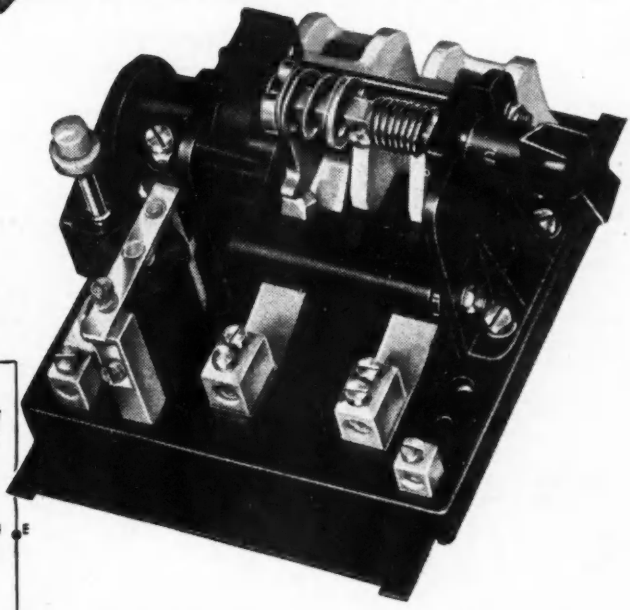
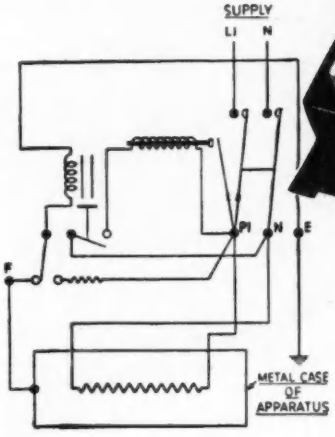


DIAGRAM OF CONNECTIONS :



The design of the HENLEY Earth-Leakage Circuit-Breaker incorporates an entirely new method of operation with a complete absence of toggles and delicate mechanism. The full mains voltage is utilized to operate the Circuit-Breaker by means of an integral relay system. Complies with B.S. 842-1939. Full details in Booklet 53/B.

HENLEY

EARTH-LEAKAGE CIRCUIT-BREAKERS

(VOLTAGE OPERATED)

W.T. HENLEY'S TELEGRAPH WORKS CO. LTD. 51-53 HATTON GARDEN, LONDON, E.C.1

MEASURE AIR-FLOW THE EASY WAY

use a
METROVICK
VELOMETER

Direct measurement of air flow in open airways or ducts is a simple task with a Metrovick Velometer. Available in a variety of ranges up to 0-6000 ft/min., the Velometer weighs only 2 lbs. and is truly portable. It is extremely simple to use, giving a direct indication of air velocity in feet per minute without timing, conversion tables or other calculations.
Metrovick Velometers are precision built and each is individually calibrated and tested. Full technical details are available upon request.

METROPOLITAN-VICKERS ELECTRICAL COMPANY LIMITED, TRAFFORD PARK, MANCHESTER, 17
Member of the A.E.I. group of companies

METROVICK *Velometers for air flow measurement*

CLASSIFIED ADVERTISEMENTS

OFFICIAL TENDERS AND APPOINTMENTS

WANTED · FOR SALE WORK WANTED

Those wishing to advertise in these pages should send the text to the Classified Advertisement Dept., Electrical Times, Sardinia House, Sardinia Street, London W.C.2, before 10 a.m. on TUESDAY of week of issue. Official Displayed Advertisements are charged at 42s. per inch, and all other classified advertisements at 3s. per line. Situations Wanted will be published four times for twice the single insertion rate. Fee for Box No. and postage on replies is 2s.

TENDERS INVITED

CITY OF MANCHESTER EDUCATION COMMITTEE

EXTENSION TO THE MUNICIPAL COLLEGE OF TECHNOLOGY FUEL RESEARCH LABORATORY

TENDERS are invited for the following X-RAY EQUIPMENT.

Two sealed-off X-ray tubes for X-ray crystallographic work. One high voltage generator for sealed-off X-ray tubes with suitable controls for 230 V 50 c/s electric supply. One X-ray powder diffraction camera. One X-ray back reflection camera. Two X-ray camera mounting brackets. One X-ray monochromator. One X-ray film punch. One X-ray film illuminator and measuring device.

Tenderers should be familiar with the provisions of Standing Order 76 (a and b) of the Manchester City Council, a copy of which may be obtained from the Acting Principal, College of Technology, Manchester 1.

Tenders (in duplicate) in sealed envelopes endorsed "College of Technology, Fuel Research Equipment" should be addressed to the Chairman, College of Technology Sub-Committee, Education Offices, Deansgate, Manchester 3, so as to reach him not later than 10 a.m. on Friday, October 3, 1952.

The Committee does not bind itself to accept the lowest or any tender. (B 139)

APPOINTMENTS VACANT

Engagement of persons must be made through a Local Labour Office or Scheduled Employment Agency, if the applicant is a man aged 18-64, or a woman aged 18-59; unless the person concerned is excepted or the employment is in a managerial or professional capacity, or is otherwise excepted from the provisions of the Notification of Vacancies Order, 1952.

MIDLANDS ELECTRICITY BOARD

APPLICATIONS are invited for the following superannuable posts:—

SENIOR ASSISTANT ENGINEER (CONTRACTING)
Birmingham and District Sub-Area

Duties involve control of the technical activities of the Section, including preparation of tenders for large contracts. Experience necessary in the applications of electricity in industrial, commercial and domestic fields and in electrical installation work. Technical qualifications desirable. Salary £1,275 to £1,316 p.a. (N.J.B. Grade N.4).—Apply within 14 days, stating age, experience, salary and position, to Emil Braathen, Midlands Electricity Board, 14 Dale End, Birmingham 4.

GENERAL ASSISTANT DISTRICT COMMERCIAL ENGINEER
Central Gloucestershire Sub-Area

Duties involve preparation of specifications and estimates, planning the work and supervision of contracting section. Experience necessary in electrical contracting, including installation, maintenance and consumer service. Technical qualifications desirable. Salary £504 to £521 p.a. (N.J.B., Class "E," Grade 11).—Apply within 14 days, stating age, experience, salary and position, to D. Holt, Midlands Electricity Board, 126 London Road, Gloucester.

A. STEPHENS,
Secretary.
(B 125)

BRITISH ELECTRICITY AUTHORITY

South Eastern Division

BRIGHTON "B" POWER STATION. ASSISTANT ENGINEERS (Mechanical Inspecting, 1 Turbine House, 1 Boiler House) or (Electrical Inspecting). Successful applicants will be responsible for the inspection of all mechanical or electrical plant during maintenance, assessing extent of work and preparation of reports on defective plant and maintenance of records. Class "J," Grade 11, £619 per annum.

ASSISTANT ENGINEER (Instruments). Applicants should preferably have Higher National Certificate or similar qualification and must be experienced in the maintenance, testing and calibration of all types of Power Station instruments. A knowledge of electronics would be an advantage. Class "J," Grade 9, £699 p.a. N.J.B. Conditions of Service for both positions. Opportunities for advancement are available for the right type of person and arrangements have been made with the Local Council whereby accommodation is available for successful applicants who are at present living in rented property.

Applications on forms obtainable from the Station Superintendent, Brighton Power Station, Portslade-by-Sea, Sussex, to be received by him not later than September 30, 1952. (B 124)

LONDON ELECTRICITY BOARD

ENGINEERING DRAUGHTSMAN

APPLICATIONS are invited for the above position. The successful applicant will be based at the Southern Sub-Area Drawing Office at Beckenham, Kent, but may be required to work in any District Office within the Sub-Area.

Candidates should have had a good general and technical education and be experienced in one or more of the following subjects: building and civil engineering design; engineering drawing; plant lay-out in substations; layouts and site plans of mains work; electrical diagrams.

The post is graded under Schedule D of the National Joint Board agreement as Grade 6, £438 to £574 7s. per annum, inclusive of London Allowance.

Application forms obtainable from Establishments Officer, 46 New Broad Street, E.C.2, to be returned by October 2, 1952. Please enclose addressed foolscap envelope and quote ref V/1488/T on all correspondence. (B 126)

CITY OF SALISBURY, SOUTHERN RHODESIA

Electricity Department

VACANCY ELECTRICAL ENGINEER GRADE 1
(INSTALLATION ENGINEER)
Salary Grade £921/12/- by £36 to £1,065/12/-

APPLICATIONS are hereby invited for the post of Electrical Engineer, Grade 1 (Installation Engineer) on the above grade which, with the present cost of living allowance, amounts to £1,105 18s. 5d.-£1,278 14s. 5d., plus children's allowances of £30 per annum for the first child and £24 per annum for the next two children.

Applicants must be a Corporate Member of the Institution of Electrical Engineers, London, and have a minimum of ten years' experience on installation work since qualifying.

Candidates must be thoroughly conversant with designing and estimating for electrical installations in industrial, domestic and public buildings. The successful applicant will be required to assist, generally, with the operation and administration of the Installation Department under the control of the Consumers' Engineer. Those interested should write to the undersigned for statement of further details.

DAVIS AND SOPER, LTD.,
Agents to the City Council of Salisbury.
52 and 54 St. Mary Axe,
London E.C.3.
September 4, 1952. (B 69)

BRITISH ELECTRICITY AUTHORITY

London Division

APPLICATIONS are invited for the following superannuable posts. Salary, including London Allowance, and conditions of service in accordance with N.J.B. Agreement.

SHIFT CHARGE ENGINEER
Barnes Generating Station

Qualifications: Sound technical electrical and mechanical training, followed by practical experience of the operation and maintenance of turbines, boilers and rotary converters. Salary, Schedule A, Class "C," Grade 7, £607 19s. p.a.

SHIFT CHARGE ENGINEER
Watts Grove Generating Station

Qualifications: Sound technical training, preferably to Higher National Certificate standard, followed by practical experience of operation and control of boilers, turbines and switchgear. Salary, Schedule A, Class "E," Grade 7, £660 9s. p.a.

SHIFT CHARGE ENGINEER
Glaucus Street Generating Station

Qualifications: Sound technical training, preferably to Higher National Certificate standard, followed by practical experience of operation and control of boilers, turbines and switchgear. Salary, Schedule A, Class "D," Grade 7, £643 13s. p.a.

JUNIOR ENGINEER
Blackwall Point Generating Station

Qualifications: Sound technical training and preferably have reached Higher National Certificate standard in electrical engineering, or equivalent. Previous experience in generating station an advantage. Duties include operation and control, under supervision, of generating plant, and good opportunities are offered for gaining experience with modern P.F. boilers, turbines and auxiliary plant. Applicants must be prepared to accept shift duties if required. Salary, Schedule A, Class "F," Grade 14, £456 p.a.

SECOND ASSISTANT ENGINEER (MECHANICAL)
Construction Department Divisional H.Q.

Applicants should be Corporate Members of the Institution of Mechanical Engineers and be experienced in the practical layout and design of power station plant; the study of thermodynamics and economic aspects; the preparation of specifications and the supervision of mechanical plant contracts. Some generating station operating experience would be an advantage. Salary, Schedule C, Class "AX EX," Grade 2, £849 9s. to £1,108 p.a.

THIRD ASSISTANT ENGINEER (MECHANICAL)
Construction Department Divisional H.Q.

Applicants, with qualifications leading to Corporate Membership of the Institution of Mechanical Engineers, should have experience generally similar to those for above post to assist in the preparation of specifications and handling of mechanical plant contracts. Salary, Schedule C, Class "AX/EX," Grade 5, £660 9s. to £900 18s. p.a.

Applications, stating age, qualifications and experience, to the Divisional Secretary, B.E.A., London Division, Ergon House, Horseferry Road, S.W.1, within 14 days of this advertisement. (B 128)

MERSEYSIDE AND NORTH WALES ELECTRICITY BOARD

SERVICE CENTRE SUPERVISOR required in the Board's Service Centre at Warrington. Salary £560 to £820 per annum (N.J.C. Grade 4).

Applicants must have a wide knowledge of the electricity supply industry and modern appliances for commercial and domestic use, and of the administration and control of staff in the retail business, including hire purchase trading.

The appointment is superannuable and subject to medical examination.

Applications, stating age, experience, qualifications and present appointment should be sent to the Manager (Ref. 52A), No. 2 Sub-Area, MANWEB, Electricity House, Sandiway, near Northwich, Cheshire. Closing date October 1, 1952. (B 100)

BRITISH ELECTRICITY AUTHORITY

South Western Division

JUNIOR ENGINEER required at Plymouth "B" Generating Station.

Superannuation scheme. N.J.B. conditions and salary, Class "G," Grade 16, commencing at £375.

Applicants should preferably have had generating station experience and possess the O.N.C. in mechanical or electrical engineering or equivalent qualification.

Apply by September 30, 1952, stating age, qualifications, experience, present appointment and salary, to R. C. Barrett, Divisional Secretary, 26 Oakfield Road, Bristol 8. (B 145)

CROWN AGENTS FOR THE COLONIES

TARIFF INSPECTOR required by the Government of Kenya for the Public Works Department for one tour of 40 to 48 months. Salary according to age, qualifications and experience in the scale £925, rising to £1,125 a year (including temporary allowance). Outfit allowance £30. Free passages. Liberal leave on full salary. Gratuity equal to about £125 a year payable on satisfactory completion of service. Candidates must have a thorough knowledge of the application of electricity tariffs and be capable of estimating the demand and consumption for all types of public buildings.

Apply at once by letter, stating age, full names in block letters, and full particulars of qualifications and experience, and mentioning this paper to the Crown Agents for the Colonies, 4 Millbank, London S.W.1, quoting on letter M.29586B. The Crown Agents cannot undertake to acknowledge all applications and will communicate only with applicants selected for further consideration. (B 110)

BRITISH ELECTRICITY AUTHORITY

South Western Division

FIRST ASSISTANT STATION CHEMIST required at Newton Abbot Generating Station.

Superannuation scheme. Salary, N.J.B. Class "F," Grade 9, £587 to £609.

Applicants should possess H.N.C. in chemistry as minimum qualification, be familiar with and capable of taking part in investigations and performance tests on a variety of plant. Power station laboratory experience essential.

Duties will also include some testing at Exeter Generating Station.

Apply by September 30, 1952, stating age, qualifications, experience, present appointment and salary, to R. C. Barrett, Divisional Secretary, 26 Oakfield Road, Bristol 8. (B 143)

NORTH OF SCOTLAND HYDRO-ELECTRIC BOARD

DEMONSTRATOR

APPLICATIONS are invited for the position of Demonstrator in the North Caledonia Area of the Board. Applicants should be qualified to give advice generally on electrical appliances in Showrooms and in consumers' homes. Also to give complete cooking demonstrations. Possession of the E.A.W. Certificate will be a definite advantage. The terms and conditions of employment will be in accordance with the N.J.C. Agreement (Administration and Clerical grades). Salary, Grade 1, £360 to £450).—Applications, stating age, qualifications, experience, and present position, should be forwarded within 14 days to The Area Manager, West Villa, South Street, Elgin. (B 127)

BRITISH ELECTRICITY AUTHORITY

Eastern Division

APPLICATIONS are invited for the following superannuable position. Salary and conditions of service will be in accordance with the National Joint Board Agreement:—

STATION SHIFT CONTROL ENGINEER
Little Barford Generating Station.

Salary: Class "G," Grade 10 (£588-£610 p.a.).

Applicants should have reached the standard of Ordinary National Certificate in electrical engineering or its equivalent, have experience in the operation of a switchboard at a generating station and be fully conversant with high tension switching operation and protective systems.

Applications, stating age, details of qualifications and experience, should be addressed to the Divisional Controller, British Electricity Authority, Eastern Division, Northmet House, Southgate, N.14, to arrive not later than September 27, 1952.

W. N. C. CLINCH,
Controller.
(B 117)

SOUTHERN ELECTRICITY BOARD

GENERAL ASSISTANT ENGINEER (METERS)

NO. 1 (Southall) Sub-Area, Meter Department, Waterloo Road, Uxbridge. Salary N.J.B., Class "L," Grade 13, £596 to £625 per annum, plus London Weighting. N.J.B. conditions of service.

Applicants must have had experience in a Class "A" Meter Testing Station and must be capable of supervising and co-ordinating the testing work in the Department. The successful candidate will be required to contribute to the B.E.A. and Area Boards' Superannuation Scheme, if eligible.

Applications on forms obtainable from the Sub-Area Secretary, 2-6 Windmill Lane, Southall, and returned to him not later than September 29, 1952.

F. W. KEMPTON,
Secretary.
(B 129)

BRITISH ELECTRICITY AUTHORITY

Eastern Division

APPLICATIONS are invited for the following superannuable posts in the Generation (Construction) Department at Divisional Headquarters. Salaries and conditions of service will be in accordance with the National Joint Board Agreement.

(1) SECOND ASSISTANT ENGINEERS

Salary: Schedule "C," Class "AX/CX," Grade 2, £849-£1,050 per annum, which includes London weighting.

Applicants should preferably possess an engineering degree or equivalent qualification and should have had previous experience in (a) design, layout and construction of generating stations and be capable of preparing specifications and estimates for generating plant. Experience in the conducting of correspondence with contractors and the co-ordination of work at Divisional Headquarters and on sites is also necessary; or (b) previous experience in the preparation of estimates and specifications for electrical equipment up to 33 kV associated with modern generating stations, and the conducting of correspondence with contractors and the co-ordination of work at Divisional Headquarters and on sites.

(2) THIRD ASSISTANT ENGINEERS

Salary: Schedule "C," Class "AX/CX," Grade 5, £660-£850 per annum, which includes London weighting.

Applicants should possess the Higher National Certificate or its equivalent and have had previous experience (a) in the design and installation of mechanical plant for generating stations and/or a knowledge of boiler and turbine design; or (b) previous experience in the preparation of schemes for switchgear, electrical auxiliaries, main and secondary cable installations and other equipment associated with modern generating stations. A knowledge of motor control equipment and of sequence interlocking systems would be an advantage.

(3) GENERAL ASSISTANT ENGINEERS

Salary: Schedule "C," Class "AX/CX," Grade 8, £506-£687 per annum, which includes London weighting.

Applicants should possess a good general engineering qualification and have had experience in the design and layout of mechanical equipment or electrical auxiliaries in generating stations.

Applications, stating age, qualifications and experience, should be sent to the Divisional Controller, British Electricity Authority, Eastern Division, Northmet House, Southgate, N.14, to arrive not later than October 4, 1952.

W. N. C. CLINCH,
Controller.
(B 116)

YORKSHIRE ELECTRICITY BOARD

No. 5 (Wakefield) Sub-Area

APPLICATIONS are invited for the following appointment:—

THIRD ASSISTANT ENGINEER (CONSTRUCTION)
(Vacancy No. 97/52)

Applicants must have had a sound practical training and experience in the construction, operation and maintenance of h.v. and l.v. overhead and underground distribution networks, sub-station plant and ancillary equipment.

Experience in 33 kV work and primary sub-station construction would be an advantage.

Salary: N.J.B., Class "K," Grade 10, £699-£728 per annum.

Applications, stating the above vacancy number, and giving full details of age, qualifications and experience, should be forwarded to the Manager, No. 5 (Wakefield) Sub-Area, Yorkshire Electricity Board, 1a Denby Dale Road, Wakefield, not later than October 3, 1952. (B 118)

BRITISH ELECTRICITY AUTHORITY

Yorkshire Division

SECOND ASSISTANT ENGINEER (CIVIL) required in the Generation (Construction) Department, Southern Group, Rotherham.

Applicants should have educational and engineering qualifications up to the standard required for Associate Membership of the Institution of Civil Engineers and should have experience in the design and construction of heavy foundations, river works, structures of reinforced concrete and steel, and other civil engineering and building works associated with the design and construction of power stations. Experience in the preparation of specifications, bills of quantities and estimates will be an advantage.

Salary £909 to £1,028 per annum, N.J.B. Agreement, Schedule "C", Class "AX/DX", Grade 2.

Forms of application may be obtained from the Divisional Secretary (Establishments), British Electricity Authority, Yorkshire Division, St. Mary's Road, Leeds 7, to whom completed forms should be returned within 14 days of the appearance of this advertisement. Envelopes to be endorsed "Second Assistant Engineer Civil." (B 99)

BRITISH ELECTRICITY AUTHORITY

Yorkshire Division

STATION CHEMIST required at Doncaster (New) Power Station (ultimate capacity 120 MW).

Applicants should hold the Higher National Certificate in Chemistry and have had experience of the analysis and testing of fuel, water and oils. Operational experience of modern water treatment plant would be advantageous.

Conditions of service and salary in accordance with the N.J.B. Agreement, Class "F," Grade 7, £677 to £696 per annum. Superannuation scheme.

Forms of application may be obtained from the Divisional Secretary (Establishments), British Electricity Authority, Yorkshire Division, St. Mary's Road, Leeds 7, to whom completed forms should be returned within 14 days of the appearance of this advertisement. (B 141)

BRITISH ELECTRICITY AUTHORITY

South Western Division

STATION CLERK required at Bridport Generating Station.

Superannuation scheme. Salary, N.J.C. Grade 1, £360 to £450.

Candidates should be experienced in the administrative work of a generating station, be fully conversant with wages and stores systems and the interpretation of the National Agreements for the electricity supply industry.

Apply by September 30, 1952, stating age, qualifications, experience, present appointment and salary, to R. C. Barrett, Divisional Secretary, 26 Oakfield Road, Bristol 8. (B 144)

BRITISH ELECTRICITY AUTHORITY

Southern Division

APPLICATIONS are invited for a position as BOILER HOUSE SHIFT CHARGE ENGINEER at Southampton Generating Station. Applicants should preferably be in possession of technical qualifications admitting to corporate membership of a recognised professional Institution, have had a sound mechanical training, and experience in the design and operation of high pressure boiler plant.

Salary N.J.B. Class F 9, £587 to £609.

Application forms obtainable from P. D. A. Oliver, Esq., Divisional Secretary, 111 High Street, Portsmouth, should be returned by October 1, 1952. (B 140)

BRITISH ELECTRICITY AUTHORITY

North Western Division

VACANCY No. 789. THIRD ASSISTANT ENGINEER (ELECTRICAL) for supervision of electrical installation at the new Carrington Generating Station, near Manchester. Salary £629 to £834 p.a. (Class "AX/DX", Grade 5). Applicants should have had experience of modern power station construction.

Apply to Establishments Officer, British Electricity House, 825 Wilmslow Road, Manchester 20, quoting vacancy number, not later than September 27, 1952. (B 106)

ADVERTISING AGENCY (London) needs SENIOR COPYWRITER. Advertising and/or journalistic experience necessary. Second essential a thorough knowledge of the Electricity Supply Industry.—Apply, Box No. 2031, Electrical Times. (B 130)

BRITISH ELECTRICITY AUTHORITY require in the General Design and Layout sub-Branch of the Chief Engineer's Department at Bankside: one SENIOR ASSISTANT ENGINEER (N.J.B. Grade 1, £975 to £1,353) and one SECOND ASSISTANT ENGINEER (N.J.B. Grade 3, £814 to £1,184). Both appointments superannuable.

Candidates should have an engineering honours degree or its equivalent and must be widely experienced in the design and layout of large modern power stations. Experience in a design office handling power stations or the plant associated therewith is essential and practical experience in either the operation or construction of such stations would be an advantage.

Duties will largely consist of investigating and co-ordinating proposals for the general design and layout of power stations throughout the country.

Application forms from D. Moffat, Director of Establishments, British Electricity House, Winsley Street, W.1 to be completed and returned by October 4, 1952. Quote reference AE 289. (B 111)

DRAUGHTSMAN required with experience in detailing traction motors for straight electric and Diesel electric applications. The post offers special prospects for suitable applicant.—Apply, stating age, whether married, and giving full details of previous experience, to Personnel Officer, Crompton Parkinson, Ltd., Chelmsford. (B 132)

BOX No. replies to be addressed to the ELECTRICAL TIMES, Sardinia House, Sardinia Street, London W.C.2

Engagement of persons must be made through a Local Labour Office or Scheduled Employment Agency, if the applicant is a man aged 18-64, or a woman aged 18-59; unless the person concerned is excepted or the employment is in a managerial or professional capacity, or is otherwise excepted from the provisions of the Notification of Vacancies Order, 1952.

ELECTRICAL DRAUGHTSMAN required for large iron and steel works in the North West. Must be experienced in work's sub-station layout, h.t. and l.t. distribution systems, lighting layouts, etc.—Apply, giving details of age, training, experience and technical qualifications to Box No. 2001, Electrical Times. (B 59)

ELECTRICAL DRAUGHTSMEN required for lighting installations and power distribution layouts for industrial plants. London office; pension scheme; 5-day week.—Write full particulars, age, qualifications and experience to Box 6152, c/o Charles Barker and Sons Ltd., 31 Budge Row, London E.C.4. (B 47)

ELECTRICAL ENGINEER wanted as technical representative on sales side of storage battery company, aged 23-27, minimum qualification: H.N.C. in electrical engineering. Excellent opportunity for technical man with energy and liking for dealing with people.—Write Box ET 762, L.P.E., 110 St. Martin's Lane, W.C.2. (B 104)

ESTIMATOR (JUNIOR) required by electrical manufacturers dealing with specialised motors and generators. Preferably with test-bed experience. London district. State experience, age and salary required.—Box No. 1961, Electrical Times. (B 22)

EWBANK & PARTNERS, LTD., have a vacancy for a qualified ELECTRICAL ENGINEER who must have had experience in the preparation of specifications, estimates and contract documents and is competent to take charge of large engineering contracts from the design stage through to the completion of work at site.—Applications in writing, stating age and giving full details of training and experience, should be addressed to the Secretary, Ewbank & Partners, Ltd., 10-11 Grosvenor Place, London S.W.1. (B 74)

HANDLEY PAGE (Reading) LTD., The Aerodrome, Woodley, Reading, have a vacancy in their Design Office for a SENIOR AIRCRAFT ELECTRICAL DRAUGHTSMAN. They have an interesting project in hand and the post is progressive and offers good scope for advancement to the right man.—Please send full particulars to the Personnel Officer. (B 21)

JOHNSON AND PHILLIPS LTD. require a RESEARCH ENGINEER for their cable works. Applicants should possess a recent degree and preferably have knowledge of cable making, aptitude for research important.

In addition a vacancy exists for a DEVELOPMENT ENGINEER of Higher National Certificate standard for work in connection with power cables and accessories for 22 kV and above.—Applications in writing, stating age, experience, qualifications and salary expected, to Employment and Welfare Manager, Johnson and Phillips Ltd., Charlton, S.E.7. (B 120)

JOHNSON AND PHILLIPS, LTD. require a SENIOR TESTER in their Switchgear Works. Applicants should be of National Certificate standard and have experience in testing industrial switchgear up to 11 kV. Applications in writing, stating age, training, experience and salary required to Employment and Welfare Manager, Johnson and Phillips, Ltd., Charlton, S.E.7. (B 102)

MACHINES AND CONTROL GEAR ENGINEER required by the Steel Company of Wales Ltd., for their Electrical Development Department. Applicants must have had design experience with a leading manufacturer; preferably engaged on electrical equipment for iron and steel works, and should possess an electrical engineering degree or equivalent.—Applications should be addressed to: The Personnel Superintendent, The Steel Company of Wales Ltd., Box No. 3, Port Talbot, Glam. (B 5)

MANAGER required for cable factory producing rubber and plastic cables. Must be very strict disciplinarian and an expert practical man. Accommodation provided.—Write, stating age, experience and salary required. Box No. 1999, Electrical Times. (B 54)

OPPORTUNITIES occur in London area for SENIOR DRAUGHTSMEN for work on development and mechanical design of electrical machinery: 5-1,500 h.p. Exceptional salaries for capable men.—Box No. 2025, Electrical Times. (B 112)

PIRELLI-GENERAL CABLE WORKS LTD., have vacancies for experienced ENGINEERS to supervise erection of steel tower and wood pole transmission lines. —Write, giving experience, age and salary expected, to Overhead Lines Department, Eastleigh, Hants. (B 19)

QUALIFIED ELECTRICAL ENGINEER, A.M.I.E.E. or exempting examination, aged 27-38 years, possessing a comprehensive knowledge of electrical installation work in all types of buildings, including factories, hospitals, schools, cinemas, etc., and fully conversant with the recognised wiring systems and all relevant regulations governing this type of work. Must possess knowledge of building construction and be capable of reading architects' and engineers' drawings. Able to prepare complete electrical specifications and illumination schemes. Successful applicants will be required to work in Glasgow or Edinburgh. Candidates should be of Scottish birth or extraction. Five-day week. Pension fund.—Reply giving details of age, qualifications, experience and salary required to Box No 2019, Electrical Times. (B 105)

SALES MANAGER. Applications are invited for the appointment of Manager of the London office of a large Midlands company manufacturing heavy electrical equipment. The appointment is open to Corporate Members of I.E.E. who have extensive sales experience with a similar company and who are aged between 35 and 45 years. Salary by mutual arrangement, but in a four-figure range.—Box No. 2017, Electrical Times. (B 101)

TECHNICAL ASSISTANT required for London. Work involves structural design in connection with overhead transmission and distribution lines, and experience preferable but not essential. Possession of Higher National Certificate in Civil Engineering, or equivalent electrical qualifications, an advantage. Pension fund. Staff canteen. Five-day week. Salary according to qualifications and experience.—Apply, in writing, to Staff Officer, British Insulated Callender's Construction Co., Ltd., 21 Bloomsbury Street, London W.C.1. (B 131)

TRANSMISSION LINE CONSTRUCTIONAL ENGINEER is required by old-established British Cable Company for service in India and Pakistan. Applicants should have had an electrical training and at least 5 years' experience in charge of the construction of steel tower lines for working voltages of 66 kV and over. The salary will be according to experience and qualifications, and terms and conditions of the appointment will be discussed with applicants who are invited to an interview in London. Applications (stating age) should include full details of education, qualifications, training and experience.—Box No. 1975, Electrical Times. (B 7)

UNILEVER LIMITED invite applications for the post of ELECTRICAL ENGINEER for large N.W. London factory. Responsible for staff and maintenance of all electrical plant, comprising public supply, diesel alternators, sub-stations, h.t. ring main, transformers, h.t. and m.t. switchgear, motors, starters, lighting and all associated distribution cables. Applicant should be between 30 and 40 years of age, have held a post with similar responsibilities and must have thoroughly sound practical experience of electrical installation and maintenance. Preference given to A.M.I.E.E., but applicants must hold at least H.N. Certificate. Superannuation scheme, salary according to experience, appointment subject to medical examination.—All applications, which may contain copies of two or more recent testimonials, will be treated in the strictest confidence, and should be addressed to Personnel Division (KAB 38), Unilever Limited, Unilever House, Blackfriars, London E.C.4. (B 119)

FOSTER
TRANSFORMERS LTD.
South Wimbledon, S.W.19

require

TRANSFORMER DRAUGHTSMEN

Annual bonus in addition to generally recognised pay rates. Good working conditions in modern factory with welfare and canteen services and active sports and social club. Conveniently situated with good Tube and bus services.—Apply to the Personnel Officer. (B 103p)

X-RAY ENGINEER with experience of modern apparatus required to visit a Near East country for one year before returning to permanent position in England. Splendid opportunity for a suitable qualified applicant.—Write, giving details of experience, etc., to Watson and Sons (Electro-Medical) Ltd., East Lane, North Wembley. (B 121)

APPOINTMENTS WANTED

ELECTRICAL ENGINEER, B.A.Sc., age 30, experienced as electrical superintendent of large mining operation, hydro and diesel plants, desires situation, local or foreign, in field of industrial applications, operation, maintenance, construction.—Reply to Box No. 2037, Electrical Times. (B 147)

SALES REPRESENTATIVE (32), single, representing cable and wire manufacturers, S. Wales, West England, seeks situation preferably Lancashire or North England. Other areas considered. Clerical, sales experience, some electrical knowledge.—Box No. 2013, Electrical Times. (B 98)

WORK WANTED

A.C. and d.c. Motor Rewinds and Repairs. Prompt service, fully guaranteed. Edgware 5566 (4 lines). —Service Electric Co., Ltd., Stanmore, Middx. (A 19)

CASTINGS. Fisher Foundries, Ltd., Greet, Birmingham, have capacity for brass, gun metal and soft grey iron machine moulded repetition castings weighing 1-30 lb. Loose pattern work up to 3 cwt. Delivery by road to all parts. Tel.: B'ham, Victoria 0197. (A 647)

CONDENSER and TRANSFORMER CASES. Special boxes and covers. Sheet metal and press-work for the electrical trade. May we quote you? A.I.D. approved.—Conway-Tolhurst Ltd., Airport, Cardiff. ▸ (A 613)

MOTOR GENERATOR SETS built to customers' requirements from new and/or modern reconditioned machines. Guaranteed for twelve months. Good deliveries, competitive prices.—Enquiries to Thos. W. Ward, Ltd., Albion Works, Sheffield. Tel. 23611 (Ext. 347). (A 709)

WELDING WORK WANTED. Large capacity available in all materials and methods. Keen prices and good workmanship. Difficult jobs our speciality. A.I.D. approved.—Conway-Tolhurst, Ltd., Airport, Cardiff. (A 612)

ZEROS REFRIGERATORS. Complete range of REPAIR AND SERVICE now available. Equipment reconditioned to pre-war manufacturers' specifications.—Time Engineers, Ltd., Refrigeration Specialists, Victory Road, Rainham, Essex (Rainham 4625), or Southern Area Agency (Tel.: Springpark 4217). Electrical spares supplied to the trade. (B 55)

AGENCIES

FLUORESCENT tube refilling specialists require AGENTS in all areas excepting Lancs. Must have facilities for storing and distribution of tubes.—Qualpron (Elect.), 43 Crawford Street, Glasgow W.1. (B 133)

MANUFACTURER of immersion heaters, light fittings, etc., requires FIRST-CLASS AGENT for Scotland.—Box No. 2033, Electrical Times. (B 134)

DUTCH MANUFACTURERS
OF
RELAYS, REMOTE CONTROL SWITCHES AND MOTOR SWITCHES

wish to communicate with a well introduced wholesale dealer for the sale of their products in England. Please forward letters to:

BOX NO. 2015
c/o ELECTRICAL TIMES (B 107p)

WANTED

£50,000

Immediate cash available for purchase of New Ball and Roller Bearings, all types. Steel Balls and Rollers. Top prices paid. Purchases from Traders only.

CLAUDE RYE BEARINGS
895-921 Fulham Road, London, S.W.6
RENown 6174 (20 lines) (A 328p)

A.C.-D.C. MOTORS, STARTERS, complete change-over installations, etc.—A.A. Electrical Co., Ltd., 67 Rothschild Road, Chiswick Park, W.4. Tel.: Chiswick 5105. (A 11)

ANYONE owning a TRICITY COOKER over 30 years old should write, giving model No., age and condition. We are anxious to obtain the oldest possible sample for which we offer in FREE EXCHANGE a cooker of the latest type.—Tricity Cookers, Ltd., 109 Kingsway, London W.C.2. (B 135)

SURPLUS STEEL STOCKS wanted. Strips, bars, sheets, etc.—Details to Morleys (Birmingham), Ltd., Regina Works, Alcester Street, Birmingham 12. (A 203)

WANTED, D.C. and A.C. ball-bearing MOTORS, MOTOR GENERATOR SETS, DYNAMOS and ALTERNATORS.—Full details to Britannia Manufacturing Co., Ltd., 22-26 Britannia Walk, London N.1. (A 7)

WANTED for prompt cash, ferrous and non-ferrous SCRAP; also plant for dismantling. Buyers of secondhand machinery and plant for re-use.—W. and H. Cooper, Ltd., 176 Brady Street, Bethnal Green, E.1. (A 1)

WANTED, Large quantity of 4-in. outside diameter TUBES from the dismantling of old Babcock Water-tube boilers. Best prices paid. Prepared to purchase Babcock and Wilcox Water-tube boilers for dismantling. —Apply, giving full details to Midland Iron and Hardware Co., Cradley Heath, Staffs. (A 3)

WANTED, ROTARY CONVERTORS, any size.—Universal, 221 City Road, London E.C.1. (A 9)

FOR SALE

CABLES & WIRE

COPPER CONDUCTOR surplus to contract available for sale; approximate quantity 15 miles 3/147, 25 miles No. 1 s.w.g., 16 miles No. 3 s.w.g., 30 miles No. 3/0 s.w.g., 10 miles 3/158 cadmium copper.—Apply, Box No. 2005, Electrical Times. (B 91)

ELECTRIC BLANKET RESISTANCE WIRES, glass covered, plastic covered, Eureka nylon, 25, 60, 80 ohms per yard resistance. Large quantities available.—Write: Box No. 2029, Electrical Times. (B 122)

205 YARDS 0·10 four-core P.I.L.C. jute served new, on drum. £400.—Box No. 2035, Electrical Times. (B 137)

DOMESTIC APPLIANCES

IMMERSION HEATERS, GRUBB new 8 kW model. No Purchase Tax. All lengths 16 in. to 30 in. Provision for intermediate loading. Fully guaranteed. Immediate delivery.—Write for list and trade terms to Distributors, John Owner and Co., Ltd., Springfield Road, Birmingham 13. Tel.: Springfield 2939. (B 25)

ENGINEERING PLANT & MATERIALS

ALUMINIUM ALLOY, new flat sheets, size 6 ft. by 3 ft. by 24 gauge. Price per lb., ex works: 1 cwt.; 3s. 5d. per lb.; 5 cwt., 3s. 3d. per lb.; 10 cwt., 3s. 1d. per lb., 1 ton, 2s. 11d. per lb.; 2 tons, 2s. 10d. per lb. Under 1 cwt., 24s. per sheet. Approximate weight of each sheet, 4 lb. Available ex stock.—D. McMaster and Co. Ltd., Mount Bures Works, Mount Bures, Essex. Tel.: Bures 351/2. (B 62)

ONE, unused 130 kVA, 11,000 V, 3-phase, 50-cycle, oil-immersed, wheel-mounted P.F. CONDENSER.—Apply, John Maddock and Co., Ltd., Ironfounders, Oakengates, Shropshire. (B 92).

750,000

NEW BALL RACES ROLLER, THRUST AND TIMKEN RACES IN STOCK. STOCK LISTS AVAILABLE.

CLAUDE RYE BEARINGS

895-921 Fulham Road, London, S.W.6
RENown 6174 (20 lines) (A 329p)

PETERMANN No. 2 Pinion and Gear-cutting Machine. Pedestal type, motorised, fully automatic magazine feed; perfect condition; can be seen in operation. £600 or offer.—Tel.: Canonbury 5094. Aircraft Patents, Almeida Street, N.1. (B 149)

THE HARPENDEN WATER CO., LTD., 33 High Street, Harpenden, have for disposal one automatic VOLTAGE REGULATOR, 100 kVA. Makers' specification to stabilise outgoing voltage at 425 V (subject to 10% hand set adjustment), 3 phase, 50 c/s, within plus or minus 1% if incoming voltage varies between 425 and 335 V. Three-phase, oil-immersed, naturally cooled indoor type; complies with B.S.S. 171/1936. Condition as new. May be seen by appointment. (B 136)

WELDING EQUIPMENT. Four 10-kVA 200/500 V, 50 cycles, transformer welding equipment by Actarc, output 15/200 amps.

D.c./a.c. Motor Generator Welding Set by Quasi Arc/Laurence Scott 480 V d.c., output 20/80 V, 200 amps, ball bearings, with starter, voltmeter and ammeter, mounted on bogey.

Several 22/32-kVA Transformer Welding Sets, input 400 V, 50 cycle supply, double and single operator type, oil immersed transformers, output 15/250 amps, maximum range 500 amps, with regulators, mounted on bogeys.

200/440 V, 50 cycle supply, air-cooled Transformer Welding Set by Metropolitan Vickers. "Thermac" type, output 85/95 V, 300/450 amps with regulator and ammeter.

Oil-immersed Transformer Welder by English Electric Co., 400 V, 50 cycles, input, output 5/300 amps. Also switch giving low, medium and high output. With regulator.

36-kVA Sciaky Spot Welder, 400 V, 50 cycle supply, watercooled electrodes, pneumatic operated head by foot switch, 18-in. throat, tapping switch giving short, medium and long welds, with Igranic timer.

250-amp. single operator petrol-driven Welding Generator Set comprising Morris 4-cyl. engine, hand starting, complete with daily fuel tank, usual accessories for engine, direct coupled to 7.5 kW. 30 V, 250 amp. d.c. generator, ammeter, voltmeter. On fabricated chassis.

Petrol-driven Welding Set, comprising 6-cyl. engine, electric starting, direct coupled welding generator 16/18 V, 625/312 amps, inbuilt exciter running at 1,500 r.p.m., complete with current regulator, voltmeter, ammeter.

George Cohen, Sons and Co., Ltd., Wood Lane, London, W.12. Tel.: Shepherds Bush 2070 and Stanningley, nr. Leeds. Tel.: Pudsey 2241. (B 113)

46 kVA r. 600/3/50 G.E.C. CAPACITOR for sale, complete with O.C.B. and ammeter; with auto transformer for 440 V.—Offers to Box No. 2023, Electrical Times. (B 109)

GENERATING PLANT

DIESEL ALTERNATOR SETS in stock up to 500 kVA 400/440 V, 3-phase, 50 c/s, 4-wire. Detailed stock list post free on request.—Thos. W. Ward, Ltd., Albion Works, Sheffield. Tel.: 26311 (Ext. 347). (A 712)

GENERATING SET for Sale with Petter Atomic 168 b.h.p. Diesel engine and B.T.H. 160 kW d.c. Generator 230 V, full load 696 amps. Slate board, volt and ammeter and many accessories.—Full details, photos, F. J. Edwards Ltd., 359 Euston Road, N.W.1. EUS. 4681. (B 146)

LIGHTING EQUIPMENT

PURLEY CHOKES AND BALLASTS. Our 80 W Tapped h.p.f. Ballast, with Starter Switchgear-holder incorporated, is proving itself the most popular unit. Suitable for most fittings. 57/6 each, subject.—F. W. Blanshard, Ltd. (Dept. ET), Purley, Surrey. Uplands 4818-9. (A 20)

QUANTITIES of 75-100-150 W DISPERSIVE REFLECTORS and also 100 W vertical ELLIPTICAL REFLECTORS to clear at 50% off list price. Send for sample.—J. E. Wildbore, Ltd., 6/12 Peter St., Oldham (Main 4475). (B 50)

MOTORS & STARTERS

A. A. ELECTRICAL CO. FOR A.C.-D.C. MOTORS, SWITCHGEAR, EXHAUST FANS, HOISTS, REDUCTION GEARS, new or reconditioned units.—Chiswick 5105, Chiswick 5605, 67 Rothschild Road, W.4. (A 10)

All types and sizes of

Industrial Electrical Equipment

ELECTROPOWER COMPANY LIMITED

Kingsbury Works, Kingsbury Road, London N.W.9.
Telephone: COLindale 4621/2. (A 18p)

A. C. and D.C. MOTORS, all sizes, large stocks. Fully guaranteed.—Milo Engineering Works, Ltd., Milo Road, East Dulwich, S.E.22. (Forest Hill 2278-9). (A 5)

A. C. and D.C. MOTORS, GENERATORS, from stock.—Service Electric Co., Ltd., Honeypot Lane, Stanmore, Middx. Edgware 5566/9. (A 13)

A. C. and D.C. MOTORS, GENERATORS, SWITCHGEAR, etc., always in stock. Let me have your inquiries.—G. E. Whittaker, Wellington Mill, Bolton Road, Blackburn. Tel. 7322. (A 6)

A. C. MOTORS, BRAND NEW. Delivery from stock. Fractional to 200 h.p., 600, 750, 1,000 and 1,500 r.p.m., 400/440 V, 3-phase, 50 c/s, with or without control gear. Also numerous reconditioned a.c. and d.c. motors and other electrical plant. Detailed price stock list post free on request.—Thos. W. Ward, Ltd., Albion Works, Sheffield. Tel. 26311 (Ext. 347). (A 713)

FOR ELECTRICAL MOTORS, GENERATORS, ALTERNATORS, SWITCHGEAR, please send your inquiries to Oldfield Engineering Co., Ltd., 96 East Ordsall Lane, Salford 5. (A 16)

FOR SALE. Four 10 h.p. 400/3/50 cycle, 720 r.p.m., enclosed ventilated SQUIRREL CAGE MOTORS. Two by Crompton Parkinson and two by G.E.C.—Offers to Box No. 2027, Electrical Times. (B 115)

FOR Sale. One English Electric COMPENSATED INDUCTION MOTOR. 60 h.p., 400 V, 3-phase, 50 c/s., 726 r.p.m., 0·657/1·0 p.f., complete with heavy duty resistance starter. Six starts per hour. No stator switch.—Capon Heaton and Co. Ltd., Hazelwell Mills, Stirchley, Birmingham 30. (B 150)

METERS

A. C./D.C. QUARTERLY and SLOT METERS.—Brent Electrical Co., 6 Holmdale Gardens, N.W.4. (A 8)

HOUSE-SERVICE METERS, a.c. or d.c., quarterly or prepayment.—Universal Electrical, 221 City Road, London E.C.1. (A 14)

500 VOLT WEE MEGGERS for sale. Excellent condition. 9 gns. Case free.—E. Parfect, Swithland Lane, Rothley, Leics. (B 148)

TRANSFORMERS & CONVERTORS

MERCURY ARC RECTIFIER, 35-kW Hewittic bulb. Input 400/3/50 a.c. Output 400/200 V d.c., 87·5 amps. Complete with all accessories and switches. In immaculate condition. Also available, 45-h.p. d.c. Motor. Send for list machine tools.—Firebrands, Ltd., Drub, Gomersal, near Leeds. Tel.: Cleckheaton 1007. (B 151)

TRANSFORMER, 1,500 kVA, 6,600/510 V, 3/50 Hackbridge (1936) indoor O.N., tubular tank, oil gauge, thermometer pocket, breather, lifting lugs. Delta star connected, neutral brought out on secondary side. H.T. +or − 2½ and 5% tappings. Fitted H.T. trifurcating box. L.T. b/b outlet. Condition good. Available for inspection in Essex. Offers invited.—Write, Box Z.T.654, Deacon's Advertising, 36 Leadenhall Street, London E.C.3. (B 138)

TWO 1,000 kVA outdoor type TRANSFORMERS by Johnson and Phillips, new 1941, ratio 10,750/400 volts, 3 phase, 50 cycles, fitted with trifurcating boxes, off load tapping switch, etc. As new.

Two B.T.H. Draw out type H.T. SWITCHES, complete with meters, etc., for above, new 1941.

Two Crompton Parkinson L.T. Drop down type SWITCHES with meters, etc., for above, new 1941.

Two Crompton Parkinson 4-panel L.T. SWITCHBOARDS, 400/3/50, fitted with 600 amp. drop down type circuit breakers, meters, etc.

F. Burrill and Co., 109 Pencisely Road, Llandaff, Cardiff. Telephone: Llandaff 95. (A 617)

TWO 250-kW "La Cour" MOTOR CONVERTORS; 6,000/3/50 to 230 V d.c., complete with rotor starter and synchronising switch, voltmeter, etc., and 6.6 kW O.C.B. and output control panels with air break circuit breakers, etc. Makers: Bruce Peebles and Co., Ltd. Offers to Newman, Hender and Co., Ltd., Woodchester, nr Stroud, Glos. (B 414)

150 kVA 6,300/440 V 3 phase, 50 c/s., Siemens TRANSFORMER for sale. Complete with switchboard, comprising main O.C.B., voltmeter, ammeter, P.F. meter and C.T.'s; 2 100-amp. feeder switches with ammeter, busbars, cable boxes, etc.—Full details from Box No. 2021, Electrical Times. (B 108)

SWITCHGEAR

MERCURY SWITCHES are made by Hall Drysdale, and Co., Ltd., of 58 Commerce Road, Wood Green, London N.22. Tel.: Bow 7221. (A 15)

UNCLASSIFIED

APPROXIMATELY 7,500 rolls black P.V.C. Adhesive Tape: ½ in. by 22 yd. rolls at 1s. 6d. per roll.—Charles Margolis and Son, Gloucester House, 19 Charing Cross Road, London W.C.2 (Whi. 6594-5). (B 152)

ELECTRIC MOTORS. One 12½ h.p. SLIP-RING MOTOR, Victoria Electric Plant Company, 200 V, 1-phase, 50 cycles, 725 r.p.m., complete with starting gear, d.p. oil circuit-breaker, etc., and various d.c. motors. GENERATING SETS. One 200/300 V d.c. Diesel GENERATING SET, 36 kW, complete with switchboard, 22 kW, 110 V d.c. Maudsley Generator, drip-proof, compound wound, 1,100 r.p.m.—Box No. 2007, Electrical Times. (B 93)

FOR DISPOSAL. SURPLUS TELEPHONE EQUIPMENT, comprising a 45-line relay automatic exchange and six manual exchanges complete with telephones.—Apply: Chief Engineer, The Colne Valley Water Co., Aldenham Road, Watford. (B 123)

LARGE number of WOODEN BOXES, 48 in. by 36 in. by 27 in., 1-in. timber with battens, S/H. but in good condition, 30/- each.—L. W. Vass, Ltd., Ampthill, Bedford. Ampthill 2220. (B 142)

PLYWOOD-HARDBOARD: $\frac{1}{16}$ in. (bare) mahogany-type and beech plywood 12/6 per sheet, 72 in. by 36 in. Oak-faced, 50 in. by 50 in. at 22/6 per sheet. Imported hardboard, 4 ft. by 4 ft., up to 12 ft. by 4 ft. at 5½d. per sq. ft.—Send S.A.E. for lists and samples to N. Gerver, 10 Mare Street, London E.8. (B 97)

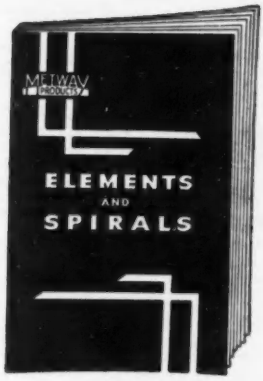
MISCELLANEOUS

CITY AND GUILDS (Electrical, etc.) on "No pass-No Fee" terms. Over 95% successes. For full details of modern courses in all branches of Electrical Technology send for our 144-page handbook FREE and post free.—B.I.E.T. (Dept. 39), 17 Stratford Place, London W.1. (A 54)

FREE! Brochure giving details of courses in ELECTRICAL ENGINEERING and ELECTRONICS, covering A.M.Brit.I.R.E., City and Guilds, etc. Train with the Postal Training College operated by an Industrial Organisation. Moderate fees.—E.M.I. Institutes, Postal Division, Dept. ET.29, 43 Grove Park Road, London W.4. (Associate of H.M.V.) (A 305)

A NEW "METWAY" CATALOGUE

Have you secured YOUR copy?



ASK FOR CATALOGUE NO. MYK/I/T.E

Please send 6d. stamps to cover postage

METWAY ELECTRICAL INDUSTRIES LTD.

KING STREET, BRIGHTON, 1

Phone: Brighton 28366. Grams: Metway, Phone, Brighton

CLOSED CIRCUIT AIR COOLERS by Premier

MEAFORD · HULL · LETCHWORTH · DARLINGTON · STOCKPORT · STEPNEY · HUDDERSFIELD · JOHANNESBURG · ADELAIDE

Of tubular construction with no connection to the outside atmosphere, these PREMIER Coolers of advanced design have already been installed in many important power stations both in Britain and abroad.

THE PREMIER COOLER & ENGINEERING CO., LTD.

Shalford, near Guildford, Surrey.

INDEX TO ADVERTISERS

Association of Steel Conduit Manufacturers 35
Automatic Telephone & Electric Co., Ltd. 25
Axon Motor Re-Winding Co., Ltd. 72

Beetle Products Co., Ltd. ... 41
Belling & Co., Ltd. 6
Belmos Co., Ltd. 47
Berry's Electric, Ltd. 20
B. & H. (Nottingham), Ltd. ... 74
Bill Switchgear, Ltd. 5
British Institute of Engineering Technology 68
British Insulated Callender's Cables, Ltd. 1
British National Electrics, Ltd.... 2
British Thomson-Houston Co., Ltd. 77
Britmac Electrical Co., Ltd. ... 41

Carter, B. & F., & Co , Ltd. ... 80
Chamberlain & Hookham, Ltd.... 46
Chase Products (Engineering), Ltd. 72
Chloride Batteries, Ltd.... ... 9
Clang, Ltd. 82
Clifford, Chas., & Son, Ltd. ... 66
Connollys (Blackley), Ltd. ... 69
Contactor Switchgear, Ltd. ... 28
Costain Concrete Co., Ltd. ... 14
Crabtree, J. A., & Co., Ltd. ... 39
Cressall Manufacturing Co., Ltd. 4
Crompton Parkinson, Ltd. ... 22

Daly (Condensers), Ltd.... ... 70
Davall, S., & Sons, Ltd. 78
Deco Engineering Co., Ltd. ... 18
Dorman & Smith, Ltd. 88
Drake & Gorham Wholesale, Ltd. 74
Durasteel, Ltd. 74

Edison Swan Electric Co., Ltd. 21, 79
Electric Construction Co., Ltd.... 73
Electrical Instrument Co. (Hillington), Ltd. 80
Electro Mechanical Manufacturing Co., Ltd. 83
Engineering & Lighting Equipment Co., Ltd.... 7
English Electric Co., Ltd. ... 24
Erskine, Heap & Co., Ltd. ... 8
Everett Edgcumbe, Ltd.... ... 50

Ferranti, Ltd. 30
Fry's Metal Foundries, Ltd. ... 52

Geipel, Wm., Ltd. 84
General Electric Co., Ltd. 33, 71
Genristo, Ltd. 72
Gilflex Conduits, Ltd. 18

Hackbridge & Hewittic Electric Co., Ltd. 86
Hague & McKenzie, Ltd. ... 38
Henley's, W. T., Telegraph Works, Co., Ltd. 55
Holophane, Ltd. 34
Hoover, Ltd. 54
Howard Clayton-Wright, Ltd. ... 82

Igranic Electric Co., Ltd. ... 10
International Combustion, Ltd.... 37

Johnson & Phillips, Ltd.... ... 11

Lancashire Dynamo & Crypto (Mfg.), Ltd. 13
Laurence, Scott & Electromotors, Ltd. 3
Legg (Industries), Ltd. 78
Lewis Spring Co., Ltd. 82
Lindley Thompson Transformer & Service Co., Ltd. 23
London Electric Wire Co., & Smiths, Ltd. 44

Martindale Electric Co., Ltd. ... 4
Measurement, Ltd. 42
Measuring Instruments (Pullin) Ltd. 84
Mersey Cable Works, Ltd. ... 15
Metropolitan Tool & Products Ltd. 84
Metropolitan-Vickers Electrical Co., Ltd. 49, 56, 80
Metway Electrical Industries, Ltd. 63
Midland Electric Manufacturing Co., Ltd. 65
M. K. Electric, Ltd. 12

Nettle Accessories, Ltd. ... 36

Parker Foundry (1929), Ltd. ... 68
Parmiter Hope & Sugden, Ltd.... 87
Parsons, C. H., Ltd. 29
Premier Cooler and Eng. Co. Ltd. 63

Renfrew Foundries, Ltd. ... 31
Revo Electric Co., Ltd. 16
Reyrolle, A., & Co., Ltd. ... 81
Rotunda, Ltd. 38

Sanders, Wm., & Co. (Wednesbury), Ltd. 85
Santon, Ltd. 67
Scemco, Ltd. 64
Scholes, Geo. H., & Co., Ltd. ... 48
Service Electric Co., Ltd. ... 84
Siemens Electric Lamps & Supplies, Ltd. 27
Siemens-Schuckert (Gt. Britain), Ltd. 66
Spencer Wire Co., Ltd.... ... 76
Sperryn & Co., Ltd. 70
Statter, J. G., & Co., Ltd. ... 80
Steatite & Porcelain Products, Ltd. 17
Sterling Cable Co., Ltd.... ... 40
Stewarts & Lloyds, Ltd.... ... 19
Stirling Boiler Co., Ltd.... ... 32
Sunvic Controls, Ltd. 45

Taylor Tunnicliff & Co., Ltd. ... 26
Thorn Electrical Industries, Ltd. 75
Transformer & Electrical Co., Ltd. 82
Tucker, J. H., & Co., Ltd. ... 51

U.S. Metallic Packing Co., Ltd.... 4

Wandleside Cable Works, Ltd.... 88
Whiteley, B. S. & W., Ltd. ... 43
Wootton & Co., Ltd. 76

Zenith Electric Co., Ltd. ... 18

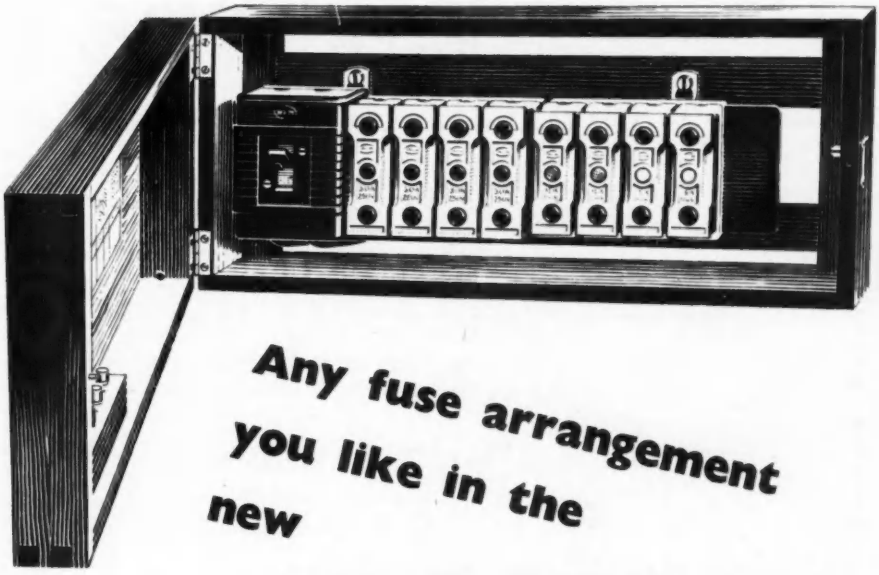
Give yourself a **LIGHTING** *chance!*
with the **NEW** **LOUVERED WINDOLUX FITTING.**

4 ft. 40 w. Twin Tube £12 . 12 . 0
5 ft. 80 w. Twin Tube £13 . 13 . 0
(List prices without lamps)

Both sizes available with alternative louvers: **Large Mesh 3″ x 3″ x 1½″**
Small Mesh 1½″ x 1½″ x 1½″

Details from

SCEMCO LTD OF SOHO STREET LONDON W1 · GER 1461



Any fuse arrangement you like in the new

MEMERA

ANY COMBINATION of fuse-ways is possible in the new unit. The 5, 15 or 30 amp. ratings can be fitted just as your job demands. It's a simple job for the installation engineer to make the change, and the design of the fuse shields makes it impossible for the householder to insert an incorrect fuse carrier.

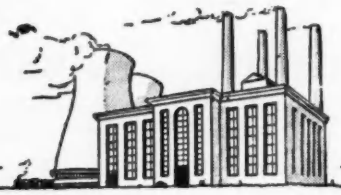
MEMERA also offers you a choice of cartridge or rewirable fuses in interchangeable carriers in a range of wood cased and metalclad consumers' service units to suit every type of installation. *Send for list* 319

MEM

Switch, fuse and motor control gear, electric fires and localised lighting equipment

MIDLAND ELECTRIC MANUFACTURING CO. LTD., TYSELEY, BIRMINGHAM, 11

Branches in London and Manchester.



Phosphor Bronze

FOR THE ELECTRICAL INDUSTRY

SHEET, STRIP, ROD, WIRE, TUBE, CHILL CAST BARS

in a range of alloys containing 3% — 12% Tin, for specific purposes; to private specifications and to British Standard Specifications

Charles Clifford & Son Ltd

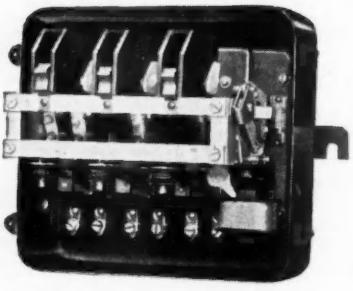
DOG POOL MILLS, BIRMINGHAM 30 *and*
FAZELEY ST. MILLS, BIRMINGHAM 5
Offices: London, Glasgow, Manchester & Dublin

Chas Clifford Birmingham

Automatic Protection

Complete protection is afforded to three-phase and D.C. Motors up to 25 H.P. at 500 Volts against sustained faults and short-circuits, while permitting harmless temporary overloads and high starting currents.

THE S.12 CIRCUIT-BREAKER



RATING UP TO 40 AMPS, 500 VOLTS.
Double and Triple-Pole

PROTECTS AGAINST

OVERLOAD
SHORT-CIRCUIT
NO-VOLT
EARTH LEAKAGE

Tested at an authorised short circuit testing station.

SIEMENS-SCHUCKERT

(GREAT BRITAIN) LIMITED

FARADAY WORKS · GREAT WEST ROAD · BRENTFORD · MIDDLESEX

Telephone: Ealing 1171-6 *Grams: Siemensdyn Brentford Hounslow*

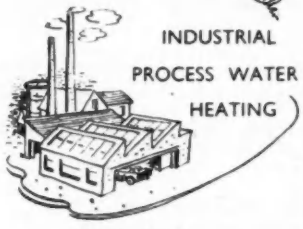
BIRMINGHAM: Tel. Midland 2082
MANCHESTER: Tel: Chorlton 1467
NEWCASTLE: Tel. 28617
GLASGOW: Tel. Central 0171
SHEFFIELD: Tel. 20673

Smee's S.29

IT PAYS TO REPLACE WORN-OUT AND INEFFICIENT SOLID FUEL BOILERS

FOR CHURCH AND HALL HEATING

COMMERCIAL GREEN-HOUSES

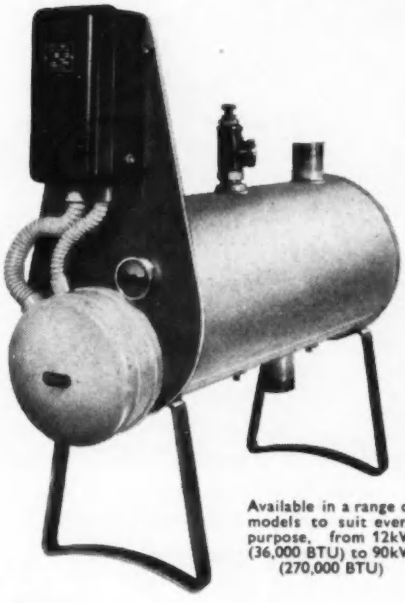


INDUSTRIAL PROCESS WATER HEATING

WITH THE

SANTON

ELECTRIC FLOW HEATER



Available in a range of models to suit every purpose, from 12kW (36,000 BTU) to 90kW (270,000 BTU)

Because:—

It is Thermostatically controlled to use minimum current, cuts out stoking, dust, fumes and ashes, requires no space for storing fuel, or structural alterations; and, needing no flues or chimney, it can be sited wherever required, obviating extensions to steam pipes.

Get full details without delay from:

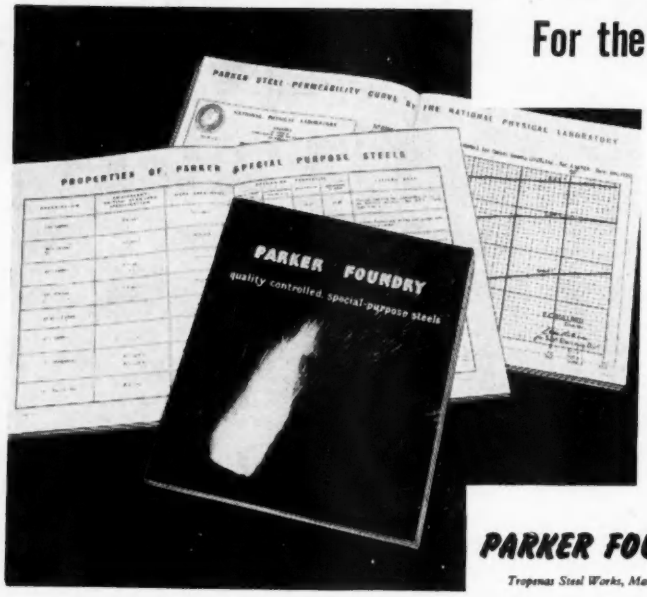
SANTON LTD. · NEWPORT · MON

Telephone 71711

Branches: London: Shepherds Bush 3311/2; Manchester: Central 1394/5; Birmingham: Midland 6421; Torquay 63568; Leeds 59361

22757

THE PARKER BOOK OF STEEL CASTINGS


PARKER STEEL PERMEABILITY CURVES BY THE NATIONAL PHYSICAL LABORATORY
PROPERTIES OF PARKER SPECIAL PURPOSE STEELS
PARKER FOUNDRY
quality controlled special purpose steels

For the Electrical Trade

A Book for the Engineer Designer: It's Free

It gives the properties of special steels for the electrical industry. High permeability steels and corresponding permeability curves and reports from the National Physical Laboratory are featured. The many foundry processes are described and examples of castings made for Britain's leading electric equipment manufacturers are also shown.

Send for your copy to-day.

PARKER FOUNDRY (1929) LTD.

Tropenas Steel Works, Mansfield Road, Derby. 'Phone : Derby 46055

IMPORTANT ANNOUNCEMENT TO AMBITIOUS ENGINEERS

THE British Institute of Engineering Technology and its associated organisations which for nearly a quarter of a century have offered unrivalled facilities for technical training by the Home Study Method, are making an important announcement in the *Daily Express* on Tuesday, September 23rd.

Every industrialist knows that the demand and the opportunities for technically-trained men are greater than ever before; if Britain and the Commonwealth countries are to play their full part in the world of today and tomorrow, there must be an adequate supply of technically-trained men able to accept positions of responsibility.

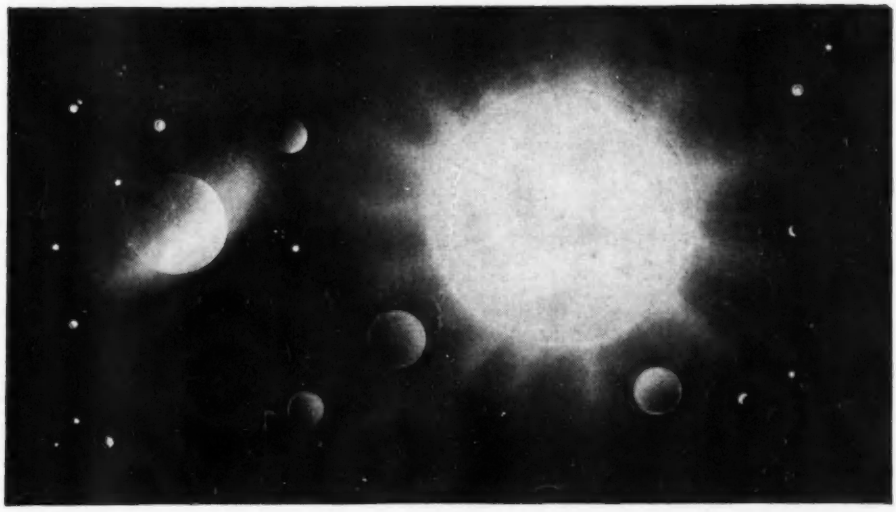
The achievements of B.I.E.T. in helping to provide these much-needed technicians have been widely praised by leading Statesmen, Industrialists, Scientists, and Educationists. The B.I.E.T. wishes to make its services known to all those ambitious men who have not yet received a copy of " ENGINEERING OPPORTUNITIES "—a 144-page book distributed free of charge which gives up-to-the-minute information about the opportunities available, salary scales, etc., and, in addition to describing our Advisory and Appointments Departments, outlines the widest range of modern Home Study Courses in all branches of Engineering, Building, etc. Accordingly, we have decided to make a half-page announcement in the *Daily Express* on Tuesday, Sept. 23rd.

Every reader of this advertisement may apply for a free copy of " ENGINEERING OPPORTUNITIES " and advice about his future career. May we remind employers that their future technicians would find much helpful information in this book.

THE BRITISH INSTITUTE OF ENGINEERING TECHNOLOGY
339A, SHAKESPEARE HOUSE, 17-19, STRATFORD PLACE, LONDON, W.1

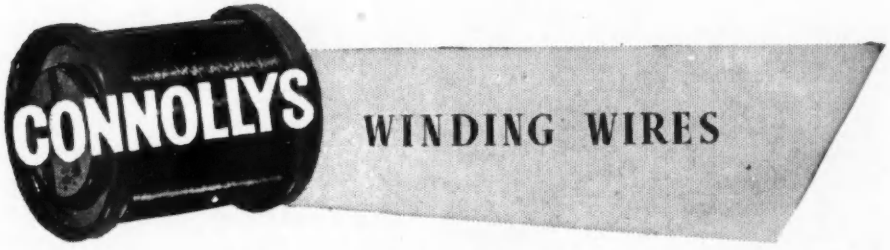
See half-page advertisement on TUESDAY, SEPT. 23rd in

THE DAILY EXPRESS



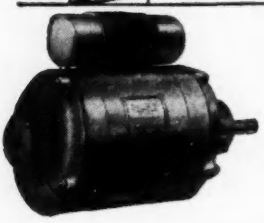
Astronomically Speaking

If our total production of all types of winding wires in the last fifty years could be tied end to end, it would stretch up to the sun—93 million miles away—and most of the way back again.
So now you have a fair idea of our total production in length—or have you?
We just mention this astronomical data en passant: the idea of running up to the face of the sun in a temperature of some 10,000°F. doesn't appeal to us in the least. Making and keeping more and more satisfied customers is our primary interest.
The largest manufacturers of fine enamelled wire in the world.



CONNOLLYS (BLACKLEY) LTD. MANCHESTER 9 Tel: CHEetham Hill 1801
LONDON OFFICE: 34, Norfolk St., London, W.C.2 TEMple Bar 5506
BIRMINGHAM OFFICE: 19 Bent Avenue, Quinton, Birmingham, 32 WOOdgate 2212

torque about electrolytics...



. . . and when you talk of motor starting, think of DALY for smooth, power-plus starting torque right from the switch-on.

For over 20 years DALY have been to the forefront in the design and manufacture of long-life electrolytics, as well as in the solving of electrolytic capacitor problems in many spheres of engineering activity.

DALY make only electrolytics. Their specialist knowledge and experience is at your service.

Standard Types from 20 mfd. to 560 mfd. Voltages from 110 to 275 V.A.C., R.M.S.

Descriptive Literature on request.

DALY (CONDENSERS) LIMITED

Condenser Specialists for over 20 years. *Phone: EALing 3127/8/9. Cables: DALYCON, LONDON*
WEST LODGE WORKS, THE GREEN, EALING, LONDON, W.5, ENGLAND

MOULDED BAYONET HOLDERS

by Sperryn TRADE MARK

A complete range of Batten, C.T.S., Skirted, Conduit, Switch and Flexible lampholders are available complying with B.S.52

Please write for Catalogue No. E.263

for Efficient Electrical Accessories of Quality
"Specify Sperryn"

SPERRYN & CO. LTD., MOORSOM STREET, BIRMINGHAM 6

LONDON OFFICE:
21-23 GREAT SUFFOLK STREET S.E.

6 reasons why G.E.C. cookers are world-famous

- Sheathed-wire oven elements.
- Counter balanced drop-down door.
- Finished in acid-resisting vitreous enamel.
- Cast iron front frame and hob.
- Extra large oven thermostatically controlled.
- In white, two-tone ivory or cream and green.

G.E.C.

ELECTRIC COOKER

Electricity ensures true coal economy

THE GENERAL ELECTRIC CO. LTD., MAGNET HOUSE, KINGSWAY, LONDON, W.C.2

E

GENRISTO *Boiling Plate*

LTD.
OSMASTON ST. NOTTINGHAM

850w—6" dia.
SOLID PLATE
EMBEDDED ELEMENT
Volts—200/10 and
230/50

COLD CATHODE
FLUORESCENT
LIGHTING
and
Neon SIGNS

COMPLETE INSTALLATIONS erected and maintained for the Trade using plain vans.

Quotations and layouts free on request

CHASE PRODUCTS (Engineering) LTD

27 PACKINGTON RD., SOUTH ACTON, W.3
Acorn 1153-4 *and at Leeds*

Guaranteed!

ARMATURE WINDING
For ALL Fractional Horse-power Motors

Up to 750 armatures per week. All work guaranteed for six months! That is the capacity and reliability of the Axon Service. We are executing regular work for leading electrical and industrial undertakings throughout the country on drills, grinders and all portable tools.

Keenest prices on Contract work.

Replacement armatures for most motors in stock.

AXON

AXON MOTOR RE-WINDING CO. LTD.
536 Moseley Road, BIRMINGHAM 12
Tel.: CALthorpe 0774

ELECTRIC CONSTRUCTION BOOSTS GAS AT BIRMINGHAM

The illustration is reproduced by permission of
WEST MIDLANDS GAS BOARD
J. E. WAKEFORD, Esq.
M.B.E., M.Inst.Gas E., M.Inst.F.
Divisional Manager.

This Electric Construction motor driving a booster at the Washwood Heath plant of the West Midland Gas Board (Birmingham District) is a 460 B.H.P. fully compensated D.C. machine with a speed range of 750/1750 R.P.M. It is pressure-ventilated from separate motor-driven fans.
The control gear for this motor and the rectifier which supplies it are of E.C.C. make.

THE ELECTRIC CONSTRUCTION Co LTD
WOLVERHAMPTON
Telephone 21455 (7 lines)

London Office: "Bushbury House" 57 Buckingham Gate, London, S.W.1
Telephone: VICtoria 3482-3

Use either of these to enquire for your Electrical Requirements

LAMPS, CABLES
WIRING ACCESSORIES
SWITCHGEAR, FITTINGS
DOMESTIC APPLIANCES
ETC.

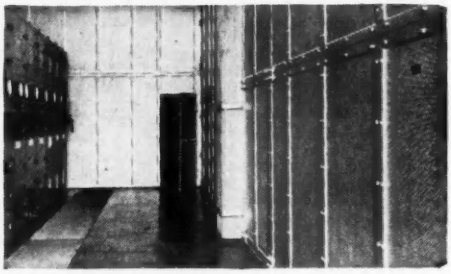
E·W·F ELECTRICAL WHOLESALERS FEDERATION MEMBER

DRAKE & GORHAM WHOLESALE LTD.
WHOLESALE AND MANUFACTURING ELECTRICAL ENGINEERS
77 LONG ACRE, LONDON, W.C.2
Tel: TEM 3993
and Branches—

MANCHESTER: 29 Piccadilly	CEN 4701
BRIGHTON: 80a Queen's Road	1894
GLASGOW: 182 St. Vincent Street	CITY 6411
BRISTOL: 2 and 4 Church Street, Temple	23509
DUBLIN: 2 Church Lane, College Green	78672

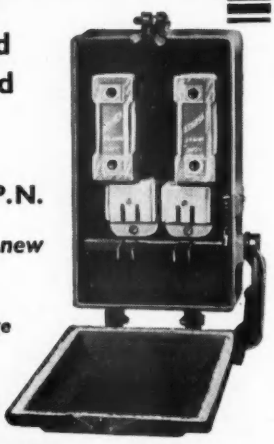
MIDLAND REPRESENTATIVE:
MR. D. EDWARDS, 35 Hudson Rd., RUGBY

DURASTEEL 3DF2
COMPOSITE STEEL-&-ASBESTOS FIRE PROTECTION PANELLING
for **STRUCTURAL FIRE PROTECTION IN POWER STATIONS...**
TRANSFORMER SCREENS • FALSE CEILINGS
LIFTSHAFT CLADDING • FIREPROOF DOORS



Send for data to manufacturers:
DURASTEEL LTD. OLDFIELD LANE **WAXlow 1051** GREENFORD
Keep Fire at Bay the DURASTEEL Way!

"BERMEX"
B 1300
Combined Switch and Fuses
250 Volts
D.P. and S.P.N.
One of our new designs
Send for 36-page Catalogue
NOW READY



B&H (Nottm.) LTD
POPHAM STREET : NOTTINGHAM
Telephone 43826 Telegrams: "VOLTS," Nottm.
LONDON OFFICE: 47-49 CALEDONIAN ROAD, London, N.1.

facts.....about

ATLAS FLUORESCENT

The '**double-life**' WHITE (3500°K) fluorescent tube has the highest efficiency of any general purpose 5 ft. 80 watt tube in the world.

Average performance figures

Light output at 100 hours . .	4400 lumens
Average throughout life	3680 lumens
Light output at 5000 hours. . . .	3360 lumens
Guaranteed average life	5000 hours
Drop in efficiency throughout life	23.6%

For the finest value in lighting today . . . . . .

ATLAS 'double-life' FLUORESCENT TUBES

Thorn

THORN ELECTRICAL INDUSTRIES LTD., LIGHTING DIVISION, 233 SHAFTESBURY AVE., LONDON, W.C.2

321

Whatever the instrument

it needs the

RIGHT CONDUCTOR

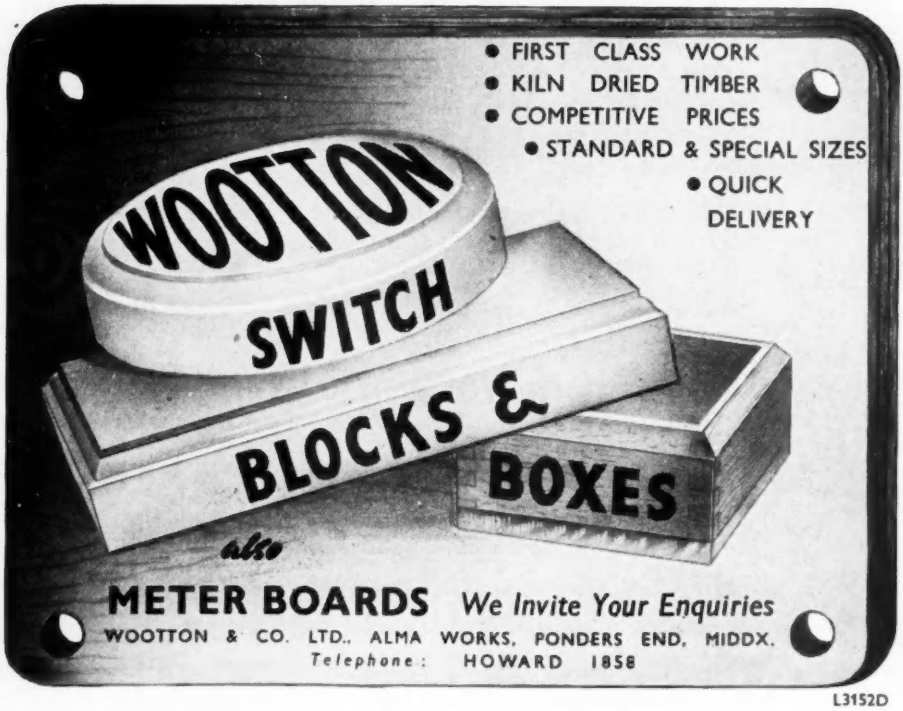
—which is, of course, equally true in the electrical sense. The uniform quality of Spencer Wire has led to the enormous extent to which it is used by electrical engineers.

H.C. ELECTROLYTIC COPPER WIRE, BARS AND STRIP

SPENCER WIRE

THE SPENCER WIRE CO. LTD., WAKEFIELD, YORKS. Tel: WAKEFIELD 3671
LONDON OFFICE: 53 VICTORIA STREET, LONDON, S.W.1. TEL: ABBEY 2562

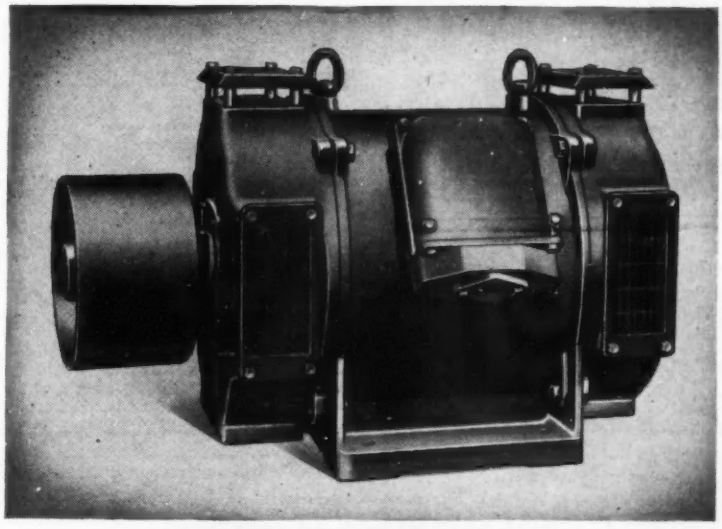
dm SN 9



L3152D

Industrial A.C. MOTORS

Squirrel-cage and Slip-ring



Typical of the BTH 'G' induction Motors.
Range: from 15 H.P. at 475 r.p.m. to 120 H.P. at 2,950 r.p.m.
Voltages: up to 650.

The choice of motor for any drive must take into account many and varied factors, technical and economic, to achieve maximum output at minimum overall cost.

In the comprehensive range of BTH motors, the one best suited to the application—in size, enclosure, rating and performance characteristics—is always to be found. Fifty-four years' experience in this field of electrical engineering, and unrivalled manufacturing facilities, place BTH in a leading position to meet the needs of industry. For A.C. and D.C. motors and control gear—second to none in reliability and proved performance—*SPECIFY BTH*

THE
BRITISH THOMSON-HOUSTON
COMPANY LIMITED, RUGBY, ENGLAND

Member of the AEI group of companies

A 4207

We invite your enquiries for

ROTARY SWITCHES

FOR ALL APPLICATIONS:

ARMAMENTS
COOKERS
HEATERS
INSTRUMENTS
MOTOR CONTROLS
RECTIFIERS
SHIPPING
WASH BOILERS
ETC., ETC.

Deliveries:
Stocks available of most of the models.
Maximum delay 4 to 6 weeks

Sole Manufacturers of **TOK** *switches*

UP TO 600 VOLTS A.C. OR D.C.

S. DAVALL & SONS LTD. EST. 1884

2, WADSWORTH ROAD, GREENFORD, MIDDLESEX **Phone: Perivale 7807**

LEGG INDUSTRIES LIMITED

Legg Industries Limited design and manufacture Charging Equipment for Electric Vehicles and Trucks of all types, and the majority of leading manufacturers specify LEGG CHARGERS for use with their equipment—both at Home and Abroad.

WHEN YOU PURCHASE A LEGG CHARGER YOU ENSURE YEARS OF RELIABLE SERVICE

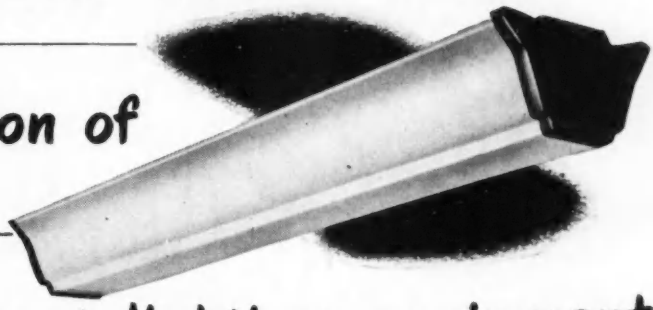
Chargers are also designed and manufactured to comply with C.S.A. requirements.

Legg **VEHICLE CHARGERS**

LEGG (INDUSTRIES) LTD.
WILLIAMSON ST., WOLVERHAMPTON

5723B

3 Important factors in the installation of

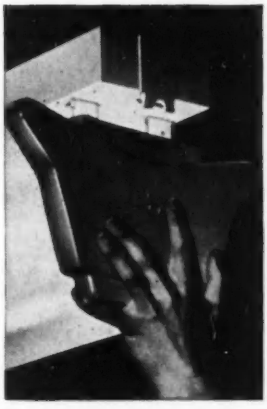


Fluorescent lighting equipment

DESIGN. Ediswan engineers have collaborated with some of Britain's leading industrial designers to produce a range of fluorescent lighting fittings planned to reduce to a minimum the difficulties with which the maintenance engineer must contend.

DURABILITY. Ediswan Fluorescent lighting equipment is specially cleaned and treated to ensure an anti-corrosive surface before the final finish is applied. Enamel finishes are stoved in Infra-red ovens to ensure hard, wear-resisting qualities and long life even under adverse conditions.

SIMPLICITY. Ediswan Fluorescent lighting equipment is as easy to maintain as it is to install. On the fitting illustrated removal of diffusing enclosures is effected by finger pressure on flush push buttons located in the end panels, making cleaning and relamping a simple operation.



The Ediswan Lighting Advisory Service will show you how to make the best use of this equipment. Write now giving details of your lighting problem. We will suggest a planned lighting scheme giving the correct illumination for your needs.

EDISWAN

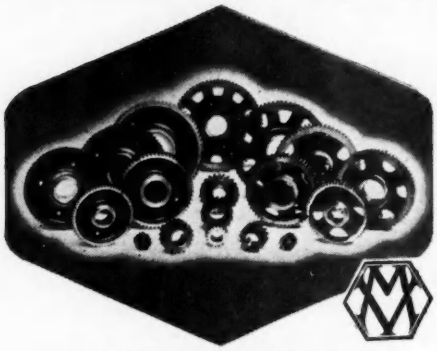
FLUORESCENT LIGHTING EQUIPMENT

THE EDISON SWAN ELECTRIC COMPANY, LTD., 155 CHARING CROSS ROAD, LONDON, W.C.2

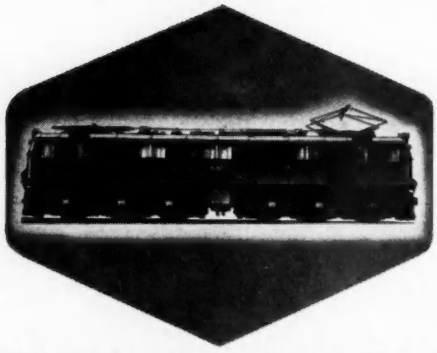
Member of the A.E.I. Group of Companies *and Branches*

LE145

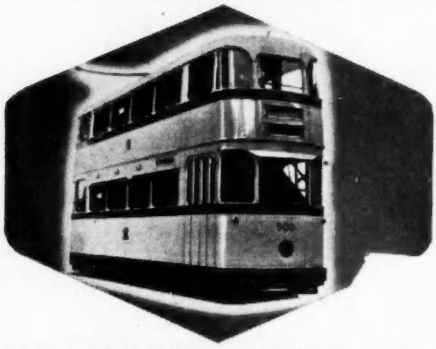
METROVICK GEARS



FOR RAILWAY



AND ROAD TRACTION



METROPOLITAN-VICKERS ELECTRICAL COMPANY LTD.
TRAFFORD PARK, MANCHESTER, 17.. *Member of the A.E.I. group of companie*

METROVICK

Gears for all Traction Drives

K/W103

EIC

ELECTRICAL

instruments

A complete range of MOVING IRON and MOVING COIL METERS
FREQUENCY METERS
Vibration proof instruments
Micro Ammeters of extreme sensitivity

THE ELECTRICAL INSTRUMENT CO (HILLINGTON) LTD
3 Boswell Square Hillington Glasgow
Phone Halfway 1166

SWITCHGEAR SPECIALISTS

STATTER

J. G. Statter & Co. Ltd., 28 Victoria Street, S.W.1

RATCHET & REVOLUTION COUNTERS

PLEASE SEND FOR LEAFLET No. 18/7

Speeds up to 6,000 r.p.m.

SOLE MAKERS AND PATENTEES:—
B. & F. CARTER & CO. LTD.
BOLTON, 9
Members of B.E.S.T.E.C. Organisation

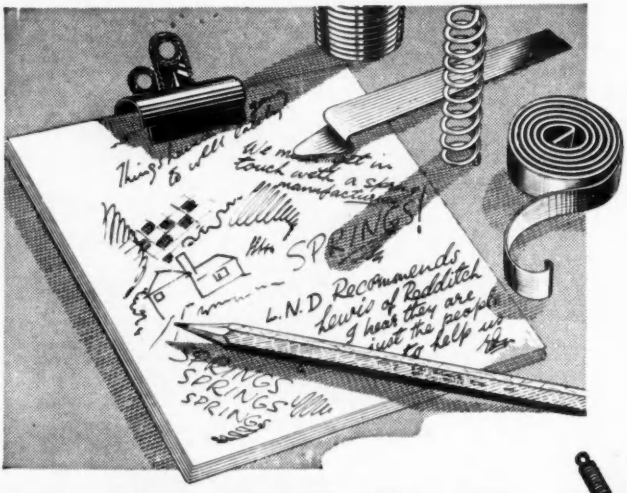
WE SOMETIMES TEND TO OVERLOOK the achievements of the electrical engineering pioneers of the past because to our eyes their designs look clumsy, old-fashioned and ill-conceived. Yet, when we take the trouble to look closer into the subject, we find that many of the first principles they laid down 50 years ago still apply today.

An early electrical engineer who aptly illustrates our point was Henry William Clothier. As far back as 1906, he had produced fundamentally new designs for what he described as Ironclad Switchgear. All over the world much of the switchgear in use and being manufactured and installed is based on the principle laid down by Clothier. Thus, the industry continues to benefit from his work. He was a switchgear specialist. He taught other men to be specialists and helped build the specialist company of Reyrolle.

Our primary concern is designing and producing switchgear, so if you have any transmission or control problems, why not talk to us.

If you want to talk switchgear
. . . talk to Reyrolle

A. REYROLLE & CO., LTD · HEBBURN · CO. DURHAM
CRC 245



L. N. D. certainly knows what he is talking about. Lewis of Redditch design springs to do just the job you want, and they turn them out from top-quality materials so that they will last as long as your product. It might be worth while to have a word with us, don't you think?

Established 1919. A.I.D. approved.

Manufacturers of Wiremen's Tapes in 30, 60 and 100 feet lengths. At present available from stock.

THE LEWIS SPRING CO. LTD.
RESILIENT WORKS, REDDITCH
Telephone: Redditch 720/1/2

LEAVE IT TO Lewis OF REDDITCH

London Office: 321 High Holborn, W.C.1. Telephone: Holborn 7479 and 7470

CLANG LTD.

CROWN YARD, CRICKLEWOOD, LONDON, N.W.2
TELEPHONE: GLADSTONE 4201

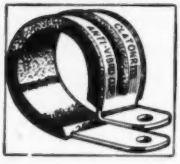
ONE
OF OVER
300 DIFFERENT
ELECTRICAL ACCESSORIES

SUPERIOR DESIGN

STURDY CONSTRUCTION

No. 5441 LAMPHOLDER

CLATONRITE
ANTI-VIBRO CLIP



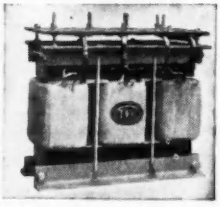
The extreme edges of this clip are rubber protected, thus fully shrouding the clip, avoiding metal to metal contact and absorbing vibration.

* *We can also supply this unique clip in a saddle type should such be required.*

Full information will be given on request.
Write to Dept. E.

HOWARD CLAYTON-WRIGHT LTD

POWER Transformers

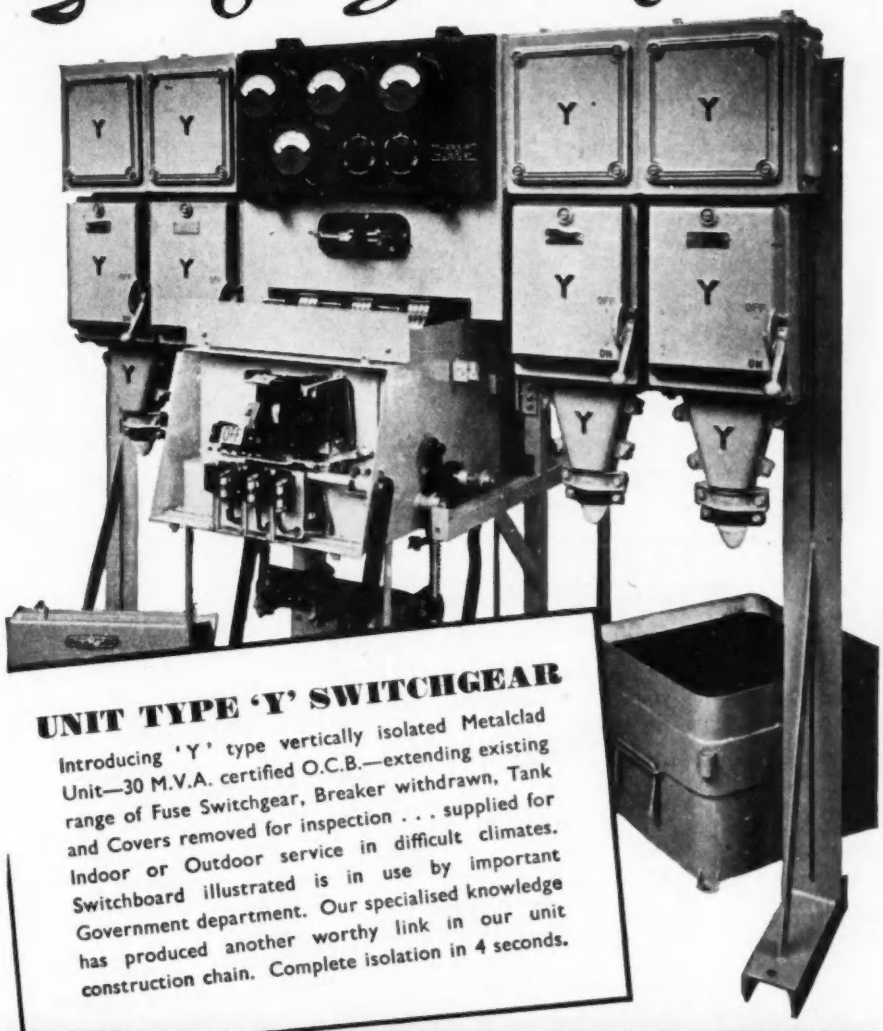


10 VA to 100 kVA
Open, Enclosed, Oil Cooled, D.W. and Auto

For Industrial Engineering, Furnaces, Electronics, Phase Conversion, etc.

THE TRANSFORMER & ELECTRICAL CO. LTD.
Eastern Works, Walthamstow, London, E.17
Phone: KEYstone 5031/2

See for yourself!



UNIT TYPE 'Y' SWITCHGEAR

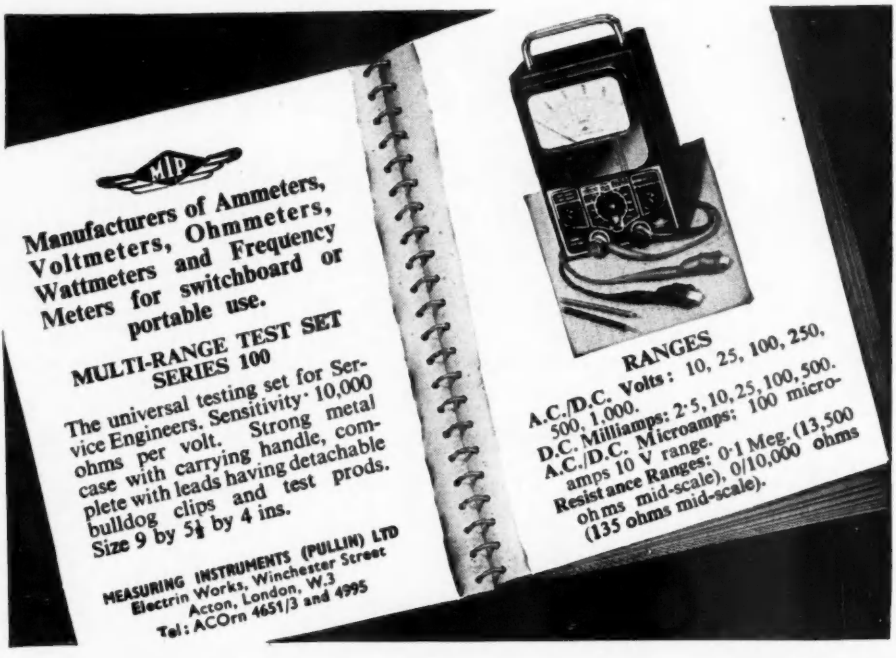
Introducing 'Y' type vertically isolated Metalclad Unit—30 M.V.A. certified O.C.B.—extending existing range of Fuse Switchgear, Breaker withdrawn, Tank and Covers removed for inspection . . . supplied for Indoor or Outdoor service in difficult climates. Switchboard illustrated is in use by important Government department. Our specialised knowledge has produced another worthy link in our unit construction chain. Complete isolation in 4 seconds.

ELECTRO MECHANICAL MANFG. CO., LTD.

Tel: Scarborough 2715/6 **SCARBOROUGH, YORKS** Grams: EMMCO. SCARBOROUGH

London Office and Showroom: Grand Buildings, Trafalgar Square, W.C.2. Phone: Whitehall 3530. Grams: Tramsuplim Rand

Associated with Yorkshire Switchgear and Engineering Company Limited, Leeds, 6


M.I.P
Manufacturers of Ammeters, Voltmeters, Ohmmeters, Wattmeters and Frequency Meters for switchboard or portable use.
MULTI-RANGE TEST SET SERIES 100
The universal testing set for Service Engineers. Sensitivity 10,000 ohms per volt. Strong metal case with carrying handle, complete with leads having detachable bulldog clips and test prods. Size 9 by 5½ by 4 ins.
MEASURING INSTRUMENTS (PULLIN) LTD
Electrin Works, Winchester Street
Acton, London, W.3
Tel: ACOrn 4651/3 and 4995
RANGES
A.C./D.C. Volts: 10, 25, 100, 250, 500, 1,000.
D.C. Milliamps: 2·5, 10, 25, 100, 500.
A.C./D.C. Microamps: 100 microamps 10 V range.
Resistance Ranges: 0·1 Meg. (13,500 ohms mid-scale), 0/10,000 ohms (135 ohms mid-scale).

Secomak

Portable
BLOWING & SUCTION TOOLS

Dust and damp can cause serious breakdowns, particularly in equipment that cannot be brushed out.

The answer lies in "Secomak" Portable Electric Blowers—the most powerful obtainable and equally useful as suction cleaners. Model 7 weighs only 10 lbs., but delivers air at 340 ft. per sec.

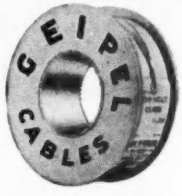
Model 70 weighs 15 lbs. and delivers air at 425 ft. per sec. with static pressure of 33in. w.g.

Both models will blow air at temperatures of 200°C. with the "Secomak" Heater Attachment.

Write for Descriptive Leaflets Nos. 101/42ET and 102/29ET.

SERVICE ELECTRIC CO. LTD.

Secomak Works, Honeypot Lane, Stanmore, Middlesex
'Phone: EDG. 5566-7-8-9



WILLIAM GEIPEL LTD.,
156-170 BERMONDSEY ST., S.E.1
FOUNDED IN LONDON 1871

METOOL

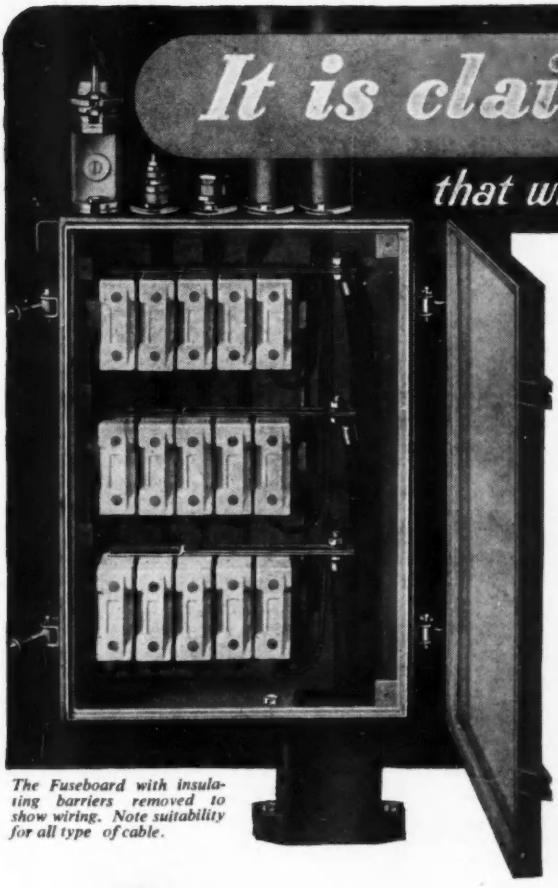
OFFER A PRECISION PRODUCT

Improved designs—fully ball bearing mounted. "METOOL" Self-winding Collector Drums for electric cable and hose.

METROPOLITAN TOOL AND PRODUCTS LTD.
21 Victoria Street, Nottingham, England.
Tel.: Nottingham 43413

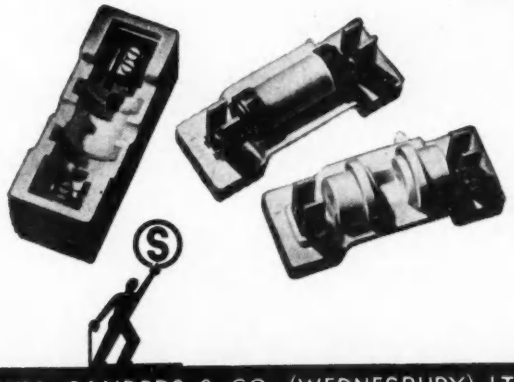
It is claimed...

that where initial cost



The Fuseboard with insulating barriers removed to show wiring. Note suitability for all type of cable.

becomes a matter of secondary consideration as compared with wiring and installation facilities, adaptability, ease of maintenance, and ability to deal with fault currents of any severity, the Super-Sandaspeed Fuseboard is in a class by itself. The Company's qualified district engineers will be happy to discuss its many features.



Comprehensive stocks are carried by selected wholesalers in all large centres of population.

SANDERS
WEDNESBURY

WM. SANDERS & CO. (WEDNESBURY) LTD., WEDNESBURY, STAFFS.

For Reliable electric power supply

One of three 65,000 kVA 11·6/146 kV 3-phase type ON/OFB Hackbridge Transformers installed at Hams Hall, "B" Power Station, Birmingham.

HACKBRIDGE TRANSFORMERS

Hewittic Rectifiers in traction service in Canada (British Columbia Electric Co.). Each bank has a capacity of 1,500 kW with high overload rating for heavy traction service. The total capacity of Hewittic Rectifiers on this system is approximately 30,000 kW.

Hewittic Rectifiers

Hackbridge Transformers and Hewittic Rectifiers have built up leading reputations in their respective fields of a.c. and d.c. supply.

Modern developments in electricity distribution, industry, and electric traction, are making ever increasing demands, both at home and overseas, for this world-famous equipment.

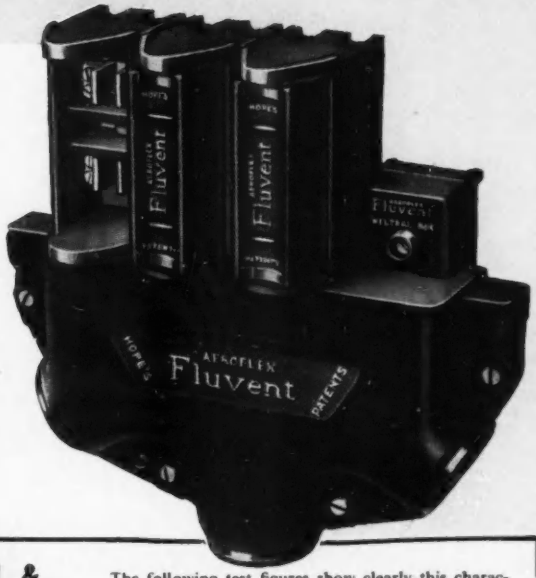
HACKBRIDGE AND HEWITTIC ELECTRIC CO., LIMITED
WALTON-ON-THAMES - SURREY - ENGLAND
Telephone: Walton-on-Thames 760 (8 lines) *Telegrams: "Electric, Walton-on-Thames"*

Printed in England for the Proprietors, THE ELECTRICAL TIMES, LTD., by SUN PRINTERS, LTD., London and Watford, Herts, and published at Sardinia House, Sardinia Street, London, W.C.2. September 18, 1952

AEROFLEX Fluvent HOPE'S PATENTS

ALL-INSULATED HOUSE SERVICE CUT OUTS

30-60-100 amp. Single Pole, Single Pole and Neutral, and Double Pole forms for 250v; Triple Pole, and Triple Pole and Neutral forms for 440v.



The popularity of these units is due to such features as their all-insulated construction, their accessibility and ease of assembly, their compactness and, of course, to the incorporation of Aeroflex high breaking capacity rewireable cartridge fuses. These in turn afford the time lag characteristic necessary to ensure discriminative fusing.

DISCRIMINATION & BREAKING CAPACITY

The following test figures show clearly this characteristic, the fuses in question being wired in series and the higher current fuse being left intact.

Test Reference	Aeroflex Cartridges in Series	Prospective Current amps. R.M.S.	Current Developed amps. peak	Result
D28 3·1	60 & 45 amps.	16,500	3,700	Discriminated. Cleared current quietly.
D29 3·2	60 & 30 amps.	16,500	3,000	Discriminated. Cleared current quietly.

PARMITER HOPE & SUGDEN LIMITED
FLUVENT Electrical Works, Longsight, MANCHESTER 12
London : 34 Victoria Street, S.W.1 Glasgow : 162 Buchanan Street, C.1
Birmingham : 39/41 Carrs Lane, 4.

dm PH 45

DORMAN

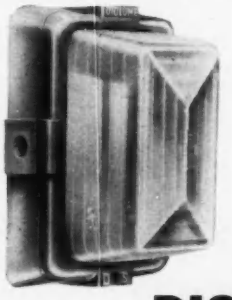
superb LIGHTING FITTINGS

DIOLUX

60 & 100 W.

THE GENERAL-PURPOSE FITTING

CAT. Nos. DU301 & DU305



DIOLUME

THE ARCHITECTURAL FITTING

UP TO 100 W.

CAT. No. DE/1

DORMAN & SMITH LTD
MANCHESTER · 5

NOT JUST **CABLE**

BUT

CABLE OF QUALITY

V.I.R. TAPED AND BRAIDED

TOUGH RUBBER

LEAD COVERED & FLEXIBLES

WANDLE · CABLE · BRITISH MADE

WANDLESIDE CABLE WORKS LTD.

106 Garratt Lane · Wandsworth · London · S.W.18

Telephone: BATtersea 2273/4 *Telegrams: "Wandleside, London"*